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TOP OF THE NEWS

Honeywell will negotiate with Japan's NEC and France's Bull to restructure its computer business. **Page 114.**

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IBM plans to expand CICS capabilities, foresees need to tie in 100,000 terminals. **Page 27.**

■

PC clone users may have trouble with Ashton-Tate's Framework II upgrade. **Page 13.**

■

Memorex jumps into the System/36 market with peripheral products and a hefty contract. **Page 14.**

■

While software firms gamble on the future direction of departmental processing, MIS managers opt for what works best now. **Page 12.**

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Retailers are focusing on the strategic use of information systems. **Page 16.**

■

Sperry will announce by mid-October what it calls "a new class of computers" along with new mainframes for the System 80 family, Unix-based systems and communications products.

■

HAL, a natural language interface for Lotus's 1-2-3, will be introduced Oct. 6, according to Lotus. The company is also developing a product to be marketed to MCI Communications that acts as a front end for MCI Mail, an informed source says.

The MCI program works in the background and can check MCI Mail at intervals determined by the user and provide a window within an application to alert the user to a message.

■

One product Lotus doesn't intend to develop in the future is another package for Apple Computer's Macintosh. After disappointing sales of the Jazz integrated package, Lotus has decided not to develop additional applications for the Macintosh, Lotus President Jim Manzi informed *Computerworld*.

See NEWS page 7

Crime wave targets VAX

Board thefts across U.S. prompt FBI investigation

By Rosemary Babe Maginnis

COLUMBUS, Ohio — A nationwide wave of thefts of Digital Equipment Corp. hardware is being investigated by the Federal Bureau of Investigation, according to police agencies and the computer firm.

In the most recent incident, the Ohio State University College of Engineering reported a Sept. 17 theft valued at $450,000 and including 22 VAX 8500 printed-circuit boards, campus police Capt. Richard Harp said last week.

Columbus-area police officials report that the university break-in was similar to VAX thefts reported elsewhere in Ohio, as well as in the states of Washington, Oregon, Florida, South Carolina, Massachusetts and New York.

The officials speculate that the stolen DEC hardware is being sold either in the U.S. or overseas.

In cases currently under investigation by the FBI, thieves have entered facilities with apparent ease, leaving few signs of forced entry and having bypassed sophisticated security systems. The FBI investigation is limited to the theft of DEC VAX printed-circuit boards, police said.

FBI Supervisor Doug Ogden at the Columbus bureau confirmed the investigation. "It's a major problem," Ogden said. "Until there is an indictment or arrest, we really have no comment. Our concern is for the ones here. There have been nationwide thefts. If we come up with common leads, or common threads, I'm sure we'll pursue [them]."

DEC is aware of the thefts and is cooperating in the investigation, a company spokesman said last week. "We are work-

See CRIME page 2

Developers get next MS-DOS

By Peggy Watt

REDMOND, Wash. — Microsoft Corp. President Jon Shirley last week said early versions of the company's much remarked-on, next-generation MS-DOS are currently being tested by selected applications developers.

Although Microsoft officials have previously declined to comment on the specifics of the operating system, Shirley, in an interview with *Computerworld*, confirmed several details provided by independent software developers. Shirley's comments indicated the development effort is far from complete. "I can't think of any time that there haven't been substantial changes to operating system software

See MS-DOS page 6

Software bugs push HP Spectrum intro back to mid-1987

By Eddy Goldberg

PALO ALTO, Calif. — Delivery of the first business system to come out of Hewlett-Packard Co.'s critically important Spectrum development project will be delayed until mid-1987, the company announced late last week.

HP earlier this year promised fourth-quarter 1986 delivery of the first nonspecialized units resulting from its five-year, $250 million Spectrum project.

The development effort was aimed at producing processors that would succeed but remain compatible with the 16-bit HP 3000 line.

See SPECTRUM page 8

CW SPECIAL REPORT

Program trading: Computer-based investing shakes Wall Street

By Alan Alper

NEW YORK — The Smith Barney, Harris Upham & Co. slogan extolling the virtues of earning money "the old-fashioned way" seems a bit out of vogue on Wall Street these days.

In stark contrast to the "earn it" method, which stresses price-to-earnings ratios, equity value and inherent risk, many venerable Wall Street firms are relying on investment strategies that are inextricably linked to esoteric, computer-based techniques. These newfangled approaches, which use computer programs to measure and track the relationship between a stock's cash value and a variety of so-called derivative instruments, such as stock options and futures indexes, have come to be known as program trading.

The Securities and Exchange Commission, as well as Wall Street veterans, have begun to examine program trading's effect on the stock market. The market's recent volatility (see chart, page 111), these people contend, is a direct result of a proliferation of program trading.

Professor Stoll

For instance, experts guesstimate that approximately 40% of the Dow Jones Industrial Average's 120-point plunge Sept. 11 and 12 was directly related to a flurry of program trading. In a given week, program trading is believed to account for roughly 25% of all stock trades.

Others contend that the steep decline resulted from a number of fundamental factors, including a weakening bond market, fears of renewed inflation, indications that interest rates would no longer decline and the impact of the proposed tax code changes.

"Forty percent of the decline may be associated with program trading, but that doesn't mean it caused it," stresses Hans Stoll, a professor at the Owen Graduate School of Management at Vanderbilt University who has studied the volatility of the market.

See PROGRAM page 111

Burroughs board doubles mid-range machines' memory

Marks firm's first use of CMOS technology

By James Connolly

DETROIT — Burroughs Corp., which six months ago enhanced its MCP/VS 1.0 operating system to support larger memory capacities, last week added that memory to its V 340 and V 360 mid-range systems.

Burroughs doubled the memory limits on those small mainframe systems from 20M bytes to 40M bytes with the introduction of the V Series 20MB board, which was developed by the company's Micro Components Group in Rancho Bernardo, Calif.

A Burroughs spokesman said the boards represent the first application of semicustom CMOS technology in a Burroughs mainframe. In addition, the boards are among the first applications of surface-mounting memory chips in Burroughs products.

Support for 40M-byte memory

Support for the larger memory capacity was announced in March when Burroughs announced MCP/VS 1.0 as a replacement for MCPIX. The key feature of the new operating system was its ability to support 40M bytes of memory rather than the 5M-byte limit of MCPIX.

At that time, Burroughs also announced plans to introduce, in 1987, the MCP/VS 2.0 with the potential to address 36 quadrillion bytes of memory while executing 10,000 concurrent jobs.

Memory field-upgrade prices are $195,000 for a 10M- to 40M-byte upgrade and $140,000 for a 20M- to 40M-byte upgrade.

AT&T exhibits R&D wares

By Elisabeth Horwitt

SAN FRANCISCO — Seeking to adopt a more open stance toward its customers, AT&T will begin exhibiting several technologies that are still in the experimental phase at Bell Laboratories, the company announced last week.

Housed at AT&T's facilities in San Francisco, the exhibit will open to customers, consultants, regulatory representatives and customer premise equipment vendors Oct. 1.

"We feel we haven't been as open to the public as we could be about what we are doing," said Richard Snowden, director of service conception for AT&T's business marketing group. The exhibit will feature wideband packet technology, a system that packetizes voice, video and data transmissions; a system that interacts verbally with the user to plot out the best route to a destination and provides directions when the user becomes lost; and a photonics switch that routes transmissions directly from one optical fiber to another.

Crime wave targets VAX

From page 1

ing actively with police and the FBI," Jeffrey Gibson, a DEC corporate information manager, said. The company gave officials serial numbers of stolen parts to aid in tracing lost hardware, Gibson said.

"The information I have is that it seems to be a sophisticated operation, and that's the reason we're helping police and the FBI where we can," the spokesman said. "Our field service organization has alerted customers to the thefts and is taking the opportunity to talk to customers about general security issues."

The university break-in showed no signs of forced entry, Harp said.

Ohio State campus police are sharing information with the FBI, as are local police in Westerville, Ohio and Upper Arlington, Ohio, where other VAX thefts occurred earlier this year.

In the Westerville theft at Schlumberger Well Service, thieves stole 50 VAX-11/780 printed-circuit boards valued at $200,000, according to police. The theft happened overnight between March 27 and 28. "There was no forced entry, no broken windows. They went through the front door and broke a lock to get in," Westerville detective Sgt. James Whitney said.

"At the time, there was no security in place and no security person on duty," Whitney said.

In Upper Arlington, Comp-u-card reported two break-ins, according to police detective Michael Worley. On March 6, Comp-u-card lost $140,000 worth of Microvax II hardware, including a TK50 tape drive, three RD53 disk drives, five computer memory cards and two DHV-11 terminal controls, police said. On July 13, a Microvax II computer and a Microvax 630QE-A2 system were stripped of hardware valued at $150,000, according to the police report.

Although the report claims the fourth-floor office door was forced to gain entrance, a locksmith determined that the locks were forced after the door was open, Worley said. "Either a key was used or the door was left unlocked. I don't know why they would make it look like it was forced. It seems normal that they would take advantage of the situation, complete their objective and have gotten out. But I don't have any reason to believe it was an inside job either," the detective said.

Tacoma, Wash., police records show a DEC facility in Greater Tacoma was robbed between Feb. 21 and 23 of $200,000 worth of printed circuit boards, according to Tacoma Police detective Robert Christensen.

In this issue

ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

THE 4TH GENERATION GAP JUST GOT WIDER.

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Telecom execs seek products, not promises

Extending existing technology keys TCA

By Elisabeth Horwitt

SAN DIEGO — While old and new offerings from several vendors promised to help customers manage their voice and data transmissions within a single network, users attending last week's Telecommunications Association (TCA) conference indicated that many companies are still a long way from voice/data integration.

MIS and telecom professionals at toy maker Applause, Inc. are "being forced to work together as we get further into voice and data integration," said communications center supervisor Judy Mirkin. "But anyone who thinks voice and data communications don't have different needs is a fool."

Organization hierarchy can be a problem, Mirkin said. "Telecom people are often seen as being in the lower echelons and MIS in the upper," she said.

Many TCA attendees were looking at proven technologies rather than chasing those that are state of the art.

Cheryl McCluney, a communications supervisor at Teleflora of West Los Angeles, said she was considering electronic mail to complement the telex connections that her company uses to communicate with its florist customers.

'Still need telex'

"We still need telex because we can send overseas without worrying about time difference, but many of our customers don't have the computer equipment needed for direct electronic links," she said. Teleflora has a mainframe, but it is not directly tied to the firm's long-distance telex links. "We still have our data and phones on separate systems."

"One of our biggest problems has always been to keep our members abreast of technology," said Prince Dyess, president of the national users group and director of telecommunications at Scripps Clinic and Research Foundation. "It is even difficult to get a group of people to see just one piece of equipment, which is why this conference is such an intense educational experience." An estimated 16,000 people attended the show, 1,000 of whom were TCA members.

According to Dyess, the TCA members' needs and size and type of company vary widely.

About 50% of the members are both data and telecommunications managers, he said. He added, however, that attendance at TCA-sponsored panels shows that the majority of members want basic, practical information on technologies such as Integrated Services Digital Networks, optical fiber links and local-area networks.

Mux net expert system tops TCA rollouts

Multiplexers, managers, measuring tools debut

By Stanley Gibson
and Elisabeth Horwitt

SAN DIEGO — Joining the movement to apply artificial intelligence techniques to network management, Case Communications, Inc. last week unveiled an expert system to assist users in configuring multiplexer networks.

The Case system, called the 5010ES-DCX, is a software package that runs on Case's 5000 Series Network Management Systems, consisting of a 32-bit Unix minicomputer. Case says the product is the first of several expert systems it will introduce.

The package was among a large number and variety of products unveiled here at the Telecommunications Association annual conference.

The Case product "is an AI system built for the novice user," said Art Alberding, Case's director of product marketing. "The system addresses the lack of experts in the field and improves the productivity of experts," he added.

Alberding said Case drew on the expertise of its own network designers in creating the knowledge base used in the system. The system's performance was then compared with the experts' in benchmark tests.

The system presents the user with a number of network configurations that can have as many as 120 nodes and selects one design as the best. Available in the fourth quarter of this year, the 5010ES-DCX is priced at $15,000.

Other developments at the conference included the following:

• Racal-Milgo, Inc. announced the Communications Management Series Diagnostic Service Unit (DSU) 1500, a multiplexer that brings the vendor's network management and diagnostic capabilities to AT&T's Digital Data Service (DDS) lines.

The DSU will only provide diagnostics for DDS services with secondary channels that can carry diagnostic information.

A Pacific Bell DDS service with secondary channel capability is currently awaiting public utility commission approval, a Racal-Milgo spokesman said. The CMS/DSU 1500 supports up to 9.6K bit/sec. data rates. It costs $1,495.

• Paradyne Corp. announced Pulse, a stand-alone network management system that performs diagnostic monitoring of up to 256 leased, digital, or dial-up lines. The Paradyne controllers and modems provide line interfaces. The system displays information on a color monitor and can generate customized reports. Pulse also can determine application response times for IBM mainframe environments such as IMS, CICS, CIST or TSO. Pricing varies from $30,000 to $125,000.

• Wang Laboratories, Inc. announced an enhanced version of Wang Integrated Office Solution (WIOS) that further integrates VS minicomputers and Wang Office system and subsidiary Telenova's digital private branch exchanges. For example, the user can be notified via screen entry or blinking red light that either a voice or electronic mail message is waiting. Available in December, Version 2 of WIOS is priced from $550 to $3,000 per user, depending on configuration.

• Timeplex, Inc. announced the Minilink/2 Data/Voice Network Exchange, a low-end member of its family of T1 multiplexers. Minilink/2 provides a 1.54M bit/sec., T1 interface for any input in the D4 framing format, the company said, including PBXs and Digital Access and Cross-Connect systems (DACS). It also supports digitized and compressed voice from analog and digital PBXs, as well as asynchronous data transmission. It can be managed by Timeplex's Link Network Management System.

Prices for Minilink/2 start at $9,255, and availability is scheduled for February, 1987.

Timeplex also introduced the Digital Signal Multiplexer Model DSM-45, which supports up to 28 T1 channels. To be delivered in February 1987, the DMS-45 starts at $23,000.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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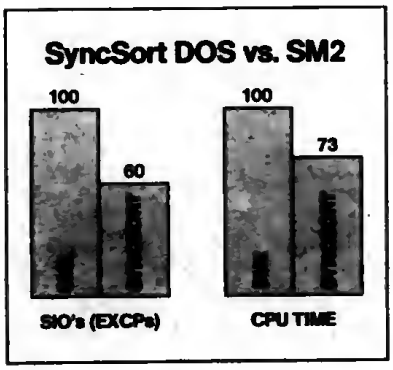

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Pundits expect IBM to unveil 80386-based PC in 1987

At odds over whether IBM will use custom processor against clones

By David Bright

All eyes have been on IBM since Compaq Computer Corp. earlier this month became the first major vendor to introduce an Intel Corp. 80386-based personal computer. Analysts generally agree that IBM will announce in 1987 a high-end PC based on the new 32-bit microprocessor.

But some analysts, citing IBM's desire to shake off the scores of clones, insist that the company's next-generation PC will be based on a proprietary processor, with the 80386 simply serving as a coprocessor for PC-DOS applications. Despite that controversy, one fact seems certain — IBM will soon begin a series of hardware and software improvements that will make it difficult for all but the strongest clone manufacturers to keep pace.

Because Compaq is the leading vendor of IBM PC-compatible systems, the idea of a new standard developing around the Compaq Deskpro 386 is not too farfetched, observers say. In addition, Phoenix Technologies, Ltd., which makes the read-only memory BIOS for the majority of PC vendors other than IBM and Compaq, is sponsoring a separate movement, Personal Computer Extended Technology, to establish a bus standard for 32-bit systems.

Considering all the 80386-related activity, some analysts suggest that IBM has no choice but to use the new chip. "To not use the 386 would be to miss a generation of a product" relative to the rest of the industry, says Bruce Watts, an analyst with Morgan Keegan & Co. in Boston. "That would be an enormous risk for them to take, and IBM is not generally a big risk taker."

Concerning proprietary processors for the next generation of PCs, a Micro/370 architecture is often mentioned by analysts. According to Clare Fleig, an analyst with the International Technology Group in Los Altos, Calif., using a Micro/370 design would offer the added benefits of compatibility with IBM's Systems Network Architecture (SNA) and some compatibility with the 4300 series line. IBM has previously released details of development work on a microprocessor designed to be compatible with its 370 architecture.

Fleig claims that a Micro/36 implementation is also a leading candidate to be IBM's 80386 alternative. Of IBM's 80386 alternatives, Fleig says the RT Personal Computer is the least likely and will remain in a technical niche.

The RT PC has not achieved much popularity so far, but John Rutledge of Dillon Read & Co. says not to write it off yet and that it could be the PC of the future. Since IBM has made a major investment in the machine, it is not about to let it die, he adds.

ANALYSIS

"One fact seems certain — IBM will soon begin improvements that will make it difficult for all but the strongest clone manufacturers to keep pace."

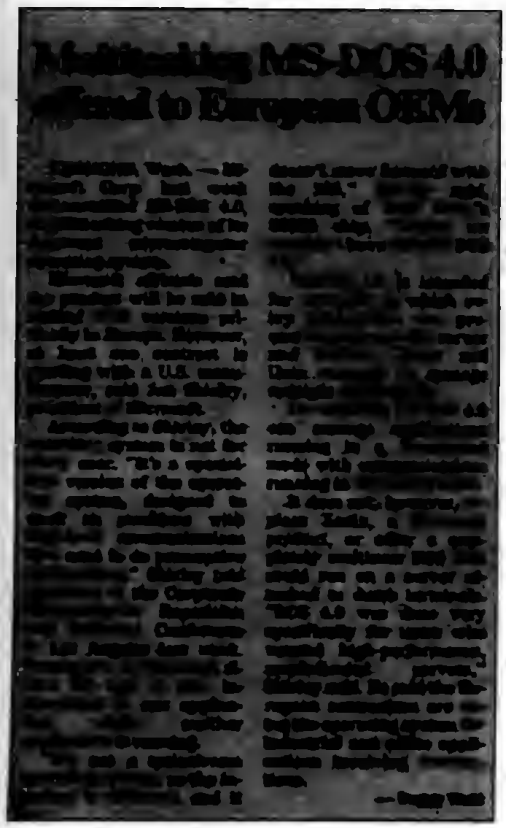
While IBM surely has 80386 projects under way, that does not necessarily mean that a product will be introdoced, Rutledge says. "Sure they have things on the drawing board ready to launch. IBM has been known to kill many a product the night before they launch it. I don't think you're going to see a PC AT and an XT based on the 386."

On the other hand, Rick Martin at Sanford C. Bernstein & Co. says there is no doubt that IBM will use the 80386 as the basis for its next PC. While IBM's 80386-based system should use such proprietary hardware designs as gate array technology and built-in, bit-mapped graphics, Martin says that the most important issue is the expected series of multitasking operating system software. Making emulation difficult, future PC-DOS versions will be a combination of Microsoft Corp. and IBM code, Martin says. The first multitasking PC-DOS version will run on the 80286, followed by a version supporting the 80386 in 80286 mode and then a version supporting the 80386 in its native mode, Martin says.

Finding it difficult to keep up with IBM's software (and to a lesser extent, hardware) changes, most of the clone manufacturers will go out of business, Martin predicts. Only companies like Compaq and Tandy Corp., which have the financial means to make fast revisions, will survive, he says. George Colony, president of Forrester Research, Inc. in Cambridge, Mass., agrees that IBM's best defense against the clones is "to push the technology."

Prior to bringing out its 80386-based system in mid-1987, IBM will announce early next year an 80286-based AT/XT machine running at 12 MHz, compared with 8 MHz on the current high-end PC AT, Colony predicts. Priced similarly to Compaq's Deskpro 386 ($6,499), the 80386-based system will be packaged in a new box with both 16- and 32-bit slots, he says. When IBM does introduce its 80386-based system, Compaq will immediately "junk" its Deskpro 386 in favor of a machine with IBM compatibility, Colony says.

While the 80386 will be IBM's primary PC processor, the chip will also serve as a coprocessor to several hybrid machines, Colony adds. These include a Series/1 386, an RT PC 386 and a System/36 386.


Multitasking MS-DOS 4.0
Eyed to European OEMs

MS-DOS sent to developers

From page 1

very late in the game," Shirley said.

Decisions made by software developers now based on the early versions of the operating system could be premature. "The more knowledge yoo get, the more likely you are to get trapped in something that's going to get changed," he said. "You could be in worse shape."

Several applications developers who work with both IBM and Microsoft told *Computerworld* that IBM has also distributed its own early releases of the next PC-DOS. One developer who has seen both claims they are identical. The two companies have previously reported a joint development agreement regarding operating system development.

Shirley said, "A limited number of software developers have access to pre-beta copies of DOS," so they can test their applications software. As for the release of the finished product, however, Shirley and other Microsoft officials would only say that the next version of DOS will not be out until after the first of the year.

Shirley said the operating system, designed for the 286/386 family of microprocessors, will be able to address the so-called protected mode, allowing access to 16M bytes of random-access memory. The 286 MS-DOS will not run on such earlier Intel processors as the 8088/8086 family because these processors cannot take advantage of the protected mode.

The operating system will support full, preemptive multitasking, Shirley said. According to Adrian King, Microsoft's director of operating systems product marketing, that ability to begin a new task while another is running will provide more effective throughput.

An interprocess communications feature of the new DOS will reportedly enable one machine to manage a program on another machine, developers said and Microsoft confirmed. In addition, Shirley said, the system includes real-time control facilities, which will reportedly provide a more efficient means of handling interrupts. The operating system will support all protection features of the 286 and also support current MS-DOS applications, according to developers and Shirley.

For users, these features would seem to promise a faster, more efficient machine that can juggle several programs and respond to instructions for one application while another is running.

Users seem as anxious as software developers to learn aboot Microsoft's future DOS strategy. Users contacted by *Computerworld* say prerelease information assists them in planning the development and use of new applications. "It helps to know about future DOS because when it's time to network, it helps to know what the 80386 system is capable of," said Bob Lovellette, PC coordinator for the chief administrative office in Los Angeles County.

Midwestern microcomputer managers received a sneak preview of Microsoft's plans in a company briefing at the Chicago Association for Microcomputer Professionals' recent conference, according to Julian Horwich, director of the association. "I think all of us were fairly concerned about DOS 5.0, Advanced DOS, or what you may call it, and with when it would arrive, what it means," Horwich said.

There is widespread speculation about the name of the next DOS. "Advanced DOS is not the name," Shirley said. "DOS 5.0 is not the name. We don't know yet what the name is going to be."

TOP OF THE NEWS

NEWS from page 1

Microsoft will not release an IBM PC version of Excel, its integrated package for Apple's Macintosh, until Microsoft's next-generation MS-DOS operating system is available to take advantage of protected mode, Microsoft President Jon Shirley implied last week.

■

RCA American Communications, Inc. (RCA Americom) announced last week it was withdrawing from Leased Channel Service, its interstate private line business. in addition, RCA Americom announced it would no longer provide Data Transaction Services, a C-band, satellite-based shared communications service connecting remote computer terminals with centralized host computers. A total of 430 employees, 280 in the leased channel service and 150 in the data transaction service, will be laid off during the next nine months.

■

Compuware Corp. of Birmingham, Mich., has announced a site-license program for its $349 Powerbase data base package that includes an unlimited site license for $180,000.

■

In a dramatic indication of the pricing trend for "me-too" micro software, Ontio Computer Products Corp. of Cambridge, Mass., last week announced Ontio 259, a $29.95 integrated microcomputer software package that it claims is file and keystroke compatible with Lotus's 1-2-3 Release 1A. Ontio is headed by three former executives of Software Arts, Inc., the developer of Visicalc, the first microcomputer spreadsheet. Software Arts was acquired by Lotus last year.

■

Adm. Bobby Inman will join Westmark Systems, Inc. as chairman and CEO after he leaves Microelectronics & Computer Technology Corp. in January. Texas-based Westmark Systems is being created as a holding company that will acquire high-technology defense contractors. Also serving on the board of directors of the new firm are former U.S. Secretary of Defense Donald Rumsfeld, former U.S. Secretary of Transportation Drew Lewis, former Chairman of the Democratic National Committee Robert Strauss and chairman and CEO of Xerox, David Kearns.

■

Digidyne Corp., continuing its software bundling suit against Data General, last week filed for $101 million in damages against the Westboro, Mass., minicomputer maker. That figure can be trebled if Digidyne is awarded damages by the U.S. District Court in San Francisco. A trial is scheduled for early next year. Digidyne President Ronald Murray said DG has not attempted to negotiate an out-of-court settlement of the case. A DG spokesman declined to comment on the situation. Digidyne brought the suit in 1978 after DG refused to license its RDOS operating systems to makers of Nova-compatible minicomputers.

Amdahl data rate hike anticipates IBM move

By James Connolly

SUNNYVALE, Calif. — In apparent anticipation of IBM's plans to increase its channel speeds, Amdahl Corp. last week boosted some data rates for its 580 series mainframes to 4.5M byte/sec.

Amdahl's 50% increase over its earlier 3M byte/sec. channel speed is intended to improve I/O performance and, in turn, overall system throughput. Amdahl Chief Operating Officer E. Joseph Zemke noted that Amdahl customers have asked for increased channel speed.

The announcement centered on enhancements to the IBM-compatible 580 mainframes and Amdahl's 6680 Electronic Direct Access Storage (EDAS) solid-state subsystem.

The enhancements do not increase the data rate for mechanical storage devices such as tape drives or disk drives such as the Amdahl 6380 and IBM 3380 drives.

The optional enhancement is known as the 580/EDAS High-Speed Channel Feature (HSCF). Amdahl claimed that the feature improves I/O service times by 32%. An Amdahl spokesman said the feature requires no applications or system software modifications and can run concurrently with non-4.5M-byte channels.

The 580/EDAS HSCF is scheduled to be available during the second quarter of 1987. It costs $25,000 per four-channel group on 580 series CPUs and $20,000 per EDAS 6880 Storage Control Unit.

The Amdahl spokesman said the feature is installed in the field by making slight hardware modifications in the CPU and the EDAS.

Amdahl's announcement came amid analyst speculation that IBM would increase the channel speed of its own 3090 mainframes.

Boston-based Yankee Group analyst Thomas Henkel reported, "We expect IBM to do the same thing either [tomorrow] or on October 6. IBM, Amdahl and the other plug-compatible manufacturers have had the capability all along to go to 6M bytes. But the general consensus is that IBM will only go to 4.5," Henkel said.

NEWS

Convergent claims performance edge for servers

Unix-based minis support 128 users

By James A. Martin

SAN FRANCISCO — Convergent Technologies, Inc. last week announced its S series of AT&T Unix-based work group servers with high-end versions that run on Motorola, Inc.'s 68020 microprocessor, support up to 128 users and reportedly offer increased price/performance over competitive minicomputer architectures.

The work group servers are based on the AT&T Unix System V operating system and support the Convergent Technologies operating system.

At the low end of the series is the S/50, Convergent's version of the AT&T Unix Personal Computer Model 3B1, based on the Motorola 68010 microchip. The S/50 supports up to five users, provides a communications link to other work groups through 3Com Corp.'s Ethernet and AT&T's Starlan local-area networks and features an IBM PC-DOS coprocessor.

The price of the S/50 ranges from $6,000 to $14,000, depending upon the number of users, with a maximum 2M bytes of random-access memory.

Building on that system are the S/120 and S/220, said to feature "more than twice" the performance of a Digital Equipment Corp. Microvax, with the S/120 in the $10,000 to $20,000 price range. The S/120 supports up to 12 users, while the S/220, priced at $14,000 to $32,000, can accommodate 22.

The S/1280 can support up to 128 users and features more than 8.8 million instructions per second of computing power in its maximum configuration. Costing between $30,000 and $350,000, the S/1280 has large data base application capabilities in either dedicated or networked environments. Maximum disk storage is 6G bytes.

In addition, the San Jose, Calif.-based OEM vendor announced that its Mightyframe minicomputer had been renamed the S/320 to fit into the S series. The company also released the S/640, a Mightyframe upgrade that features the 25-MHz version of Motorola's 68020 microprocessor, supports up to 64 users and 64M bytes of internal memory. It costs between $30,000 and $300,000.

With the exception of the S/640, the S series of servers is available now.

Spectrum late due to bugs

From page 1

"We have encountered a tuning problem relating to the I/O software, which is part of the operating system," a spokesman said. He stressed that the I/O problems are not directly related to performance of the new system. "The basic performance of the 930, measured independent of the I/O of the operating system, is meeting or exceeding expectations," he said.

HP 3000 customers already at the top of their performance requirements have been eagerly awaiting the Series 930, a 4.5 million instructions per second (MIPS) machine priced at $225,000. The delay can only hurt HP in the increasingly competitive market for mid-range systems, analysts agreed.

"This is really a tough blow for them," said Kimball Brown, an industry analyst at Dataquest, Inc. in San Jose, Calif. But, he added, "It's better to bite the bullet for six months than to come out with a bad product."

"It will definitely affect their bottom line," said Bonnie Digrius, director of software market research at Input, a Mountain View, Calif.-based research firm. "But more significant is the impact to their long-term credibility in the marketplace. Vendors now have to be responsive and deliver a product when they say they will. There are too many other choices out there today," she added.

The HP 9000 Model 840 engineering and manufacturing system is on schedule for December delivery, according to a company spokesman. The 840 and 930 are the first systems to come out of HP's Spectrum project, a complete redesign of its architecture incorporating principles of reduced instruction set computing (RISC).

The 930 was announced in late February [CW, March 3]. The Series 950, a 6.7-MIPS machine also announced in February, HP said, is still on schedule for release in the second half of 1987.

"The 3000 has done really well for HP, but it ran out of gas a year ago," Brown said. For those customers already straining at the top of their performance requirements and awaiting the 930, HP is offering an immediate upgrade to a 3000 Series 70, a 1.6-MIPS, $150,000 machine introduced in February, with an 80% trade-in allowance for subsequent upgrade to the 930.

The economic impact of the machine will not be felt this fiscal year, which ends October 31, HP President and Chief Executive Officer John A. Young said in a prepared statement. Nevertheless, analysts said, the announcement of a six-month delay will hurt. "It appears this may annoy a lot of investors," Brown said.

The situation also opens the door to Digital Equipment Corp., IBM and other vendors with mid-range systems, Brown added. "The timing was great for November," he said, noting that IBM is at least a year off in providing a homogeneous environment across its product line.

"Obviously they're having operating system problems," said John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass. "It brings to the forefront the issue of whether RISC really buys you anything in the commercial environment," he said.

RISC is an architecture that focuses on the processor, McCarthy said. "In computationally intensive environments, RISC makes sense. But in commercial environments, which aren't so computationally intensive, the benefits of RISC aren't that quickly realized."

McCarthy said that until three or four weeks ago, HP had said the 930 was right on schedule.

The HP spokesman said the RISC-based system is sound. "The fundamental RISC architecture is the same for the 840 and the 930. The fact we can ship the 840 on time confirms that the architecture works."

The 930 employs HP's proprietary Multi-Programming Executive (MPE) operating system. "Our initial projections underestimated the task at hand in moving from MPE 5 to MPE XL," the HP spokesman said.

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Honeywell rolls out Unix line with three 68000-based minis

Series aimed at white-collar mart

By James Connolly

BILLERICA, Mass. — Honeywell, Inc. moved into what it called the Unix-based, commodity-hardware minicomputer market last week with three systems built around the Motorola, Inc. 68000 chip family.

In another development last week, Honeywell announced it is considering restructuring its computer operations (see story page 114).

Honeywell announced that it is making available worldwide an expanded version of its X Superteam line of Unix-based systems that was introduced in Europe in June of 1985. The systems, running AT&T Unix System V Release 2, will supplement, not replace, Honeywell's DPS 6 and DPS 6 Plus minicomputers running the company's own GCOS 6 operating system.

The new product line is known as the XPS-100 Series and includes the X-10, X-20 and X-40 systems, which are manufactured by Honeywell Information Systems Italia. The X-10 had been available as part of the X Superteam family.

Honeywell's move into the Unix world is the latest and most serious of several attempts to sell Unix-based systems. In addition to the X Superteam effort, Honeywell has sold Unix-based engineering workstations and has made contract bids with Unix systems made by other vendors.

The XPS-100 Series is being offered as a commercial system targeted at applications such as "white-collar departmental processing," rather than as a scientific or engineering system, according to Karl Laubscher, director of entry systems for Honeywell.

"Honeywell is introducing a set of Unix products because a key part of our corporate strategy is to be a systems integrator. We want to be able to serve all of the needs of our user community," Laubscher said. He noted that many Honeywell users require not only the capabilities of Honeywell's proprietary software, but also the ability to work with operating systems such as Microsoft's MS-DOS on personal computers and Unix or 'Pick Systems' Pick operating system on multiuser systems.

Several analysts viewed the announcement as one more major vendor recognizing the need to offer Unix.

"Principally, I think Honeywell is leveraging some technology to respond to the demand for Unix rather than it being a major Honeywell commitment to Unix, such as Sperry's top-to-bottom Unix," said senior industry analyst Paul Cubbage of Dataquest, Inc.

Cubbage noted that Honeywell and other major vendors are likely to add Unix-capabilities to other systems in the product lines, including mainframes and smaller systems such as those based on the Intel Corp. 80386 microprocessor.

International Data Corp. senior research analyst Bruce Huie added that because Honeywell views itself as a systems integrator, a Unix offering "is just one piece of a much larger puzzle that they are trying to pull together."

"It is one more vendor approving Unix, in fact, System V and stating that the commercial viability of Unix for the end user is there," Huie said.

In addition to running Unix on the systems, Honeywell announced a $10 million contract under which The Ultimate Corp. will sell a Pick Systems Pick-based version of the XPS-100 Series.

Laubscher said the three systems announced last week will be distributed largely through value-added reseller and OEM channels. However, he said that Honeywell will provide direct sales channels through its own sales force for major accounts and through Honeywell's Federal Systems Division.

The X-20 uniprocessor and the X-40 dual processor are built around Motorola 68020 chips. They use 16.7-MHz 68020s as central processors and as I/O processors.

Honeywell claims that the X-20 supports up to 32 users while processing 1.7 million instructions per second (MIPS). The company said the X-20 performs 2.1 MIPS with the addition of an optional 16K-byte cache. The X-20's memory range is from 2M to 10M bytes of error detection and correction memory. It also supports up to three 145M-byte disk drives. The X-20 costs $16,580 with 2M bytes of memory, 72M bytes of hard disk storage, a 720K-byte diskette, eight workstation ports, a streaming tape port, the operating system, an interface tool and C language.

The X-40 was designed to support up to 64 users, 4M to 20M bytes of memory, three disk drives and two 16K-byte cache memories. Honeywell claimed a MIPS rating of 3.7 for the X-40. The X-40 costs $41,630 for a basic system with 4M bytes of memory, a 145M-byte disk drive and 16 user ports.

The X-10 is built around the Motorola 68010 processor. It supports up to 16 users while providing 0.41 MIPS of power without cache and 0.56 MIPS with a 4K-byte cache. The memory range is from 512K bytes to 6.5M bytes. The X-10 costs $7,475 with 512K bytes of memory, a 40M-byte disk drive, a 720K-byte diskette and four workstation ports.

Laubscher said Honeywell is examining the possibility of using either a 25-MHz 68020 or Motorola's recently announced 68030 chip in future XSP-100 Series systems.

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Vendors take opposing tacks to departmental computing

ADR, Cullinet add fuel to mini vs. LAN debate

By Donna Raimondi

While independent software vendors attempt to push departmental computing solutions in fixed directions, information system managers say they will resist making firm commitments and explore existing options.

Currently, two major software houses, known for supporting the IBM mainframe environment, are taking divergent directions toward a departmental computing future. One of them, Applied Data Research, Inc. (ADR), a leading systems software house, has endorsed IBM's departmental scenario of networked personal computers linked upward to a corporate mainframe. Meanwhile, data base management system (DBMS) maker Cullinet Software, Inc. sees Digital Equipment Corp.'s successful VAX systems as the departmental computers of the future.

While the independent software companies are taking sides on the issue, users are now making decisions based on what works best for them. "[IBM] PC-to-mainframe or VAX-to-mainframe — either one is good," says Ronald Wingate, manager of information systems at the organic chemical division of SCM Corp. in Jacksonville, Fla. But for SCM, Wingate adds, the PC-to-mainframe route is best because the shop does not process a large volume of data. "Even the PCs are not tied to the mainframe all the time. We use dial-up lines to get us to the mainframe, and we limit the amount of data we move back and forth to it."

"I see the direction remaining with centralized computing, with microcomputers tied into the mainframe," says J. Michael Mason, manager of information systems at Blackburn, a division of FL Industries, Inc. in St. Louis that manufactures electrical products for utilities and large construction operations. Using IBM PCs at the departmental level simplifies the consolidation of information, makes company information readily available and drastically reduces the logistics and maintenance operations costs, Mason adds.

Factors making mixed vendor mainframe and minicomputer setups undesirable include the difficulty and cost of staffing and operating such departmentalized centers, Mason says. "You dilute control over the data security and physical security."

Blurring systems distinctions

But for the manager of information services at a Fortune 100 battery manufacturer, the issue of security is not the deciding factor in choosing which computer systems to use. Whether or not departmental computers include PCs or minis tied to the mainframe is a moot point, the manager says. As PCs get more powerful and intervendor communications barriers break down, the distinctions between systems blur.

The manager, who asked not to be identified, has an IBM 4381 locally and uses a shared information center with other units of his company. The center includes IBM 3090s and Cray Research, Inc. supercomputers for research and development work. Most commercial work is done on IBM systems at centrally managed information processing locations, while departmental VAXs perform both scientific and commercial tasks.

"We haven't had any extra problems in the security area," the manager says. "We are more interested in the business of making batteries than in the business of managing computers. We don't want the tail to wag the dog."

Problems do arise in a mixed environment with competitive vendors pointing fingers at each other's equipment and blaming each other, the manager maintains. "You have to decide if you want a hassle-free environment with one vendor or mixed vendors and hassles. It depends on the particular need. It's a business decision to make, based on functionality rather than on policy."

Mixed-vendor environments are going to be a way of life, says Thomas Henkel, IBM analyst at the research firm The Yankee Group in Boston. While DEC has been living in that environment for years, it is a new concept for IBM — one Big Blue will probably address by attempting to control the network with products such as Netview.

"If IBM can control the network and be the key provider of networking management products, then it has made a major step to getting back on top in terms of control," Henkel says. There is an enormous market developing for companies linking VAXs and IBM mainframes. "It is a market that neither IBM nor DEC will seriously address, because that would involve supporting the other's hardware and software, and that is a very difficult pill for either company to swallow," he declares.

The software market that this multivendor environment creates is "ripe for a solid solution," Henkel says. While Cullinet seems to be on the right track in working toward distributed DBMS, he adds, it has not fully addressed the major requirement, which is applications development capabilities for the VAX that are transportable to the IBM mainframe.

'A killer of a product'

The software company Cincom Systems, Inc. has done the opposite: It has offered applications development and transportability without leaning toward distributed DBMS. "I think a combination of those two things would be a killer of a product," Henkel says.

"A number of strategies will be effective, and while ADR and Cullinet are pursuing different options, one strategy is not right and one wrong," says Bonnie Digrius, director of software marketing research at Input, the Mountain View, Calif., market research and consulting firm. The only "party lines" users have adopted are IBM's DB2 DBMS and IBM's SQL. Users "will look at independent software vendors inasmuch as their products will work with DB2 and SQL," Digrius adds.

Whether to go with PC-to-mainframe use or departmental minicomputers depends upon what applications are at issue, says David Blackwell, executive vice-president of Massachusetts Mutual Life Insurance Co. in Springfield, Mass. "We use minis for various types of departmental processing. We have Wang Laboratories, Inc., DEC and Hewlett-Packard Co. systems, all for different functions."

Blackwell's shop has one Amdahl Corp. 5860 and two Amdahl 5880 mainframes running IBM software. "There are some cases where it makes sense to hook up the PCs to the mainframe. We do a lot of that. But it really varies almost entirely by the application."

The pitfall of running mixed-vendor products is that each type of system needs a staff to support it — a fact that eliminates departmental minis as an option for smaller businesses, Blackwell says.

Lotus aims CD-ROM system at financial services firms

Offers historical stock data for 1-2-3

By Douglas Barney

CAMBRIDGE, Mass. — In an effort to bolster its line of stock market data and analysis products, Lotus Development Corp. last week announced a compact disk/read-only memory (CD-ROM) system that provides historical stock market data and a link to Lotus's 1-2-3.

The One Source product line is targeted at money management and investment firms, banks and other financial services firms. One Source will cost $11,000 to $27,000 for a one-year product license.

One Source, which is used in conjunction with 1-2-3 Release 2, consists of a Digital Equipment Corp. RRD 50 CD-ROM reader and CD-ROM disks released weekly that contain a choice of eight stock market data bases, including Value Line, Compustat and Ford Investor Services.

"You can select the data bases you want. You don't have to buy all of them," said Larry Moore, president of Lotus Information Services. "When you put them together, there are discounts."

DEC wrote software, similar to Microsoft Corp.'s recently announced extensions to MS-DOS, that allows a personal computer to access up to 550M bytes of data on a CD-ROM disk in one volume.

In addition to weekly releases of these data bases, users can recieve daily updates of the data base via modems that are installed on a hard disk. Users can also receive real-time data feeds using Lotus's Signal product. Signal is an option for One Source that will cost an additional $150 per month, Moore said.

"I was really impressed with the CD-ROM product. It is a nice combination of a large data base that is a week old, a data base that is a day old and one that is minutes old. By combining those sources, they have a system that is very up to date," said George Colony, president of Forrester Research, Inc., a Cambridge research firm. Colony previewed the product last week.

The CD-ROM products will ship in the first quarter of 1987. Although Lotus is initially supporting only 1-2-3 Release 2, the firm plans to support Symphony next year. Lotus will not support 1-2-3 Release 1A. "Architecturally, you just can't do what we are doing in 1A," Moore said.

In addition, Lotus announced Lotus Financial, a 1-2-3 extension that allows a user to access CD-ROM data from within a Lotus spreadsheet and is part of the One Source system, according to Moore. "The ability to access the information from within the spreadsheet is important," Colony said.

Microscan, a package that screens large-scale data bases and provides portfolio monitoring, is also part of the system and has been previously available.

Framework II 1.1 freezes on some IBM clones

By Douglas Barney

TORRANCE, Calif. — Users of Ashton-Tate's Framework II 1.0 on some low-end IBM Personal Computer clones found an annoying problem in upgrading to the latest version of the popular integrated package: The software simply did not work.

"It locked up," said Julie W. Good, systems coordinator for Scott Machinery Co. of San Diego. Good upgraded from Framework II 1.0 to 1.1, which no longer contained copy protection, and was forced to go back to the earlier version of Framework.

Framework product manager Marilyn M. Johnson acknowledged that the problem strikes machines that do not have an IBM, Compaq Computer Corp. or Phoenix Technologies Ltd. read-only memory (ROM) BIOS.

After being alerted to the problem last week, however, Ashton-Tate claimed to have a solution. According to Johnson, a new keyboard device driver written to ensure compatibility with IBM Personal Computer XTs and ATs was the root of the problem. The device driver was included in all copies of Framework II 1.0 produced in June or later as well as in all copies of Framework II 1.1.

Because Ashton-Tate left the old keyboard device driver in the product, users experiencing this problem can activate the original driver and run the software.

Machines unable to run Framework II 1.1 include those from PC's Limited of Austin, Texas; Triex Technology, Inc. of Anaheim, Calif.; and the Belltron Personal Computer from Caltron, Inc. of Long Beach, Calif., according to Gary Copeland, president of Epicenter Research Corp., a computer consulting firm based in Westminster, Calif.

Epicenter sells many of these low-end clones to small businesses that use Framework as the core software application, and several Epicenter customers had their systems freeze when using Framework II 1.1. In some cases, Copeland changed the ROM BIOS and was able to run the software, but this is fairly expensive.

Fortunately, Copeland, with the help of Ashton-Tate, was able to activate the original keyboard device driver and solve the problem.

Memorex unveils IBM mid-range add-ons, deal with VW

Signs $2.5M peripheral pact with auto maker

By Donna Raimondi

SANTA CLARA, Calif. — Memorex Corp. last week released five peripheral products for the IBM System/34, 36 and 38 market. The company also announced a contract with Volkswagen of America, Inc. to supply $2.5 million worth of display terminals and printers for System/36s at dealerships across the country.

The new products include two terminals and a printer for the System/34, 36 and 38 and tape and disk subsystems for the System/38. The Volkswagen contract calls for 1,800 display terminals and printers to be installed over a period of two years at more than 600 Volkswagen and Audi of America dealerships using the System/36.

"In the wake of its IBM 3380-type disk problems, Memorex has had to make do with whatever revenue it could come up with from terminals and tape drives — this announcement seems to continue that effort," said analyst Thomas Henkel of The Yankee Group in Boston.

Choosing to supply the System/34, 36 and 38 market was a good choice for Memorex, he continued, as the competition in its traditional large-system disk business is extremely intense right now. Aside from IBM itself, competition in the System/34, 36 and 38 market is light, he added.

Despite the fact that the Volkswagen deal is "pretty significant for them," Henkel said, there is still speculation among analysts that Memorex will become a captive supplier of storage products for Burroughs Corp. That possibility seems stronger than ever since the Burroughs-Sperry Corp. merger, he added.

The announced storage units have been used for three years in the IBM 4300 environment and were released in April 1986 in Europe and Canada for the System/38. The 3260T 9-track tape subsystem and the 3690-2 disk storage subsystem are alternatives to IBM's 3422 and 3430 tapes and IBM's 3370 Model A12 and B12 disk drives. Both units are available immediately.

The 3260T tape drive has a tape speed of 125 in./sec. and data transfer rates from 200K to 780K byte/sec., depending on whether it is running at 1,600 bit/in. or 5,200 bit/in. The basic unit is a 3261T controller and a 3266T tape drive in a cabinet and costs $36,800. Additional 3266T tape drives cost $17,900. Monthly maintenance charges are $400 for the tape subsystem and $165 for each additional tape drive.

The 3690-2 disk drive has a storage capacity of 729.8M bytes and a data transfer rate of 1.9M byte/sec. Two independently addressable actuators have access to 365M bytes of data each. The subsystem is an IBM 3370-A12 look-alike with a Memorex 3693-2 string controller and a 3690-2 disk drive that costs $35,480.

Up to three 3690-2 disk drives in a cabinet, similar to an IBM 3370-B12, can be added at a cost of $26,000 each. Maintenance fees are $134 per month for the controller and first spindle and $101 per month for the additional disk drives.

The two terminals have 122-key adjustable keyboards, dual session support and a network-addressable printer feature said to allow users access to any printer in a cluster. The 2180-2, a 15-in. monochrome display terminal priced at $1,995, allows users to switch between 80- and 132-col. formats. It is a plug-compatible replacement for the IBM 3180-2, Memorex said. The $2,195 2179-2, a 14-in. color terminal, can display two or seven colors. It is a replacement for IBM's 3179-200.

The 2114-2 multifunction printer, which sells for $3,595, includes three print qualities and speeds of 55, 110 and 220 char./sec. It comes with a variety of type fonts and a choice of fanfold or cut-sheet paper. The maintenance cost is $44 per month.

Chain nabs computer thief, adds companywide security

ANAHEIM, Calif. — A systems executive with a large department store chain last week told the tale of a former employee who enriched himself at company expense by tampering electronically with the retailer's payment records.

The thief, a computer operator, sidestepped the firm's data security safeguards by printing legitimate account numbers on payments and substituting his own, according to Allied Stores Corp. MIS Vice-President William Stephens, who spoke at the National Retail Merchants Association's 28th Annual Retail Information Systems Conference.

"Fortunately for us, he was a dumb operator," Stephens said in a conference session on systems security. "We have audit trails that allow us to keep track of how our information is changed and by whom."

Although it was quickly spotted, the breach still lent impetus to Allied's recent decision to find a security software package that it could adopt companywide. Allied eventually chose Top Secret from Computer Associates, Inc., according to David Cropper, MIS vice-president at The Bon, an Allied-owned store chain.

Since then, Top Secret has already found its way into Allied's Boston data center, where efforts to install the product are well under way. A second installation is progressing slowly in the firm's computing site in Richmond, Va.

It will be another two years before the Top Secret project is complete, said Jerry Van Story, head of the Richmond data center.

"Before we can make Top Secret work with the rest of our systems, we're going to have to change many things, including our data color, all our passwords and our job control language," Van Story said.

— Jeffry Beeler

Retailers seek info technology edge

Meeting spotlights strategic data uses

By Jeffry Beeler

ANAHEIM, Calif. — Taking a cue from other information-intensive industries, retail store chains are increasingly awakening to the strategic importance of systems technology.

For years, banks and airlines may have ranked among the foremost practitioners of the idea that information and technology are critical assets that provide their users with opportunities for competitive advantage. But not until comparatively recently has the same principle gained widespread popularity among retailers.

Evidence that store chains have finally recognized technology's strategic potential abounded last week in Anaheim at the 28th Annual Retail Information Systems Conference, sponsored by the National Retail Merchants Association (NRMA).

End-user computing

In most cases, retailers are using information technology simply to cut costs or otherwise improve their efficiency in some existing application or area of business specialization. Sears Roebuck & Co., for example, has launched an extensive effort in its merchandising division to promote end-user computing, according to Ramesh Rao, the firm's director of end-user computing service.

Using dumb IBM 3180 terminals, intelligent workstations, departmental processors and local networks, Sears is encouraging nontechnical end users to "assume ownership of data and systems, which have become an integral part of our business," Rao said.

Up to now, Sears' efforts to marry MIS and end users have had their greatest impact on office automation; the retailer has installed a coast-to-coast electronic mail network built around IBM's Distributed Office Support Systems.

The intent behind the end-user computing push is to give Sears a competitive edge by improving employee productivity, reducing paperwork and aiding decision making, according to Robert Ferkenhoff, national manager of Sears' systems planning and information services.

End-user computing also figures prominently in the information systems strategy at Carter Hawley Hale Stores, Inc., where knowledge workers recently gained access to assorted tools including electronic mail, spreadsheets and on-line news services. Adoption of such systems enables the firm to adapt to changing conditions, according to Carter Hawley Hale Executive Vice-President Robert Menar.

Another retailer that sees technology as a competitive weapon is Ross Stores, Inc., which recently migrated its point-of-sale (POS) data collection network from store-and-forward to real-time operation. Although the move has had little impact on end users, it does simplify a major problem by allowing the chain's incoming transactions to be formatted as they occur, rather than postponing the job until after dark.

The strategic benefits of information technology are not limited to improved efficiency or reduced overhead. After using systems to improve their functioning in tried-and-true activities, many companies go one step further.

They use MIS as a springboard to expand their marketplace or diversify into business opportunities that they never previously imagined, said Jack Nilles, information technology program director at the University of Southern California's Center for Futures Research.

In an address at the NRMA conference, Nilles cited the example of Kinko's, Inc., which operates a chain of walk-in photocopying services. By equipping its shops with an Apple Computer, Inc. Macintosh, Kinko's was able to branch out into an allied business discipline — desktop publishing — and thus enlarge its money-making possibilities, Nilles said.

Major retailers are showing heightened interest in information technology and its implications because, Sears' Ferkenhoff said, down at the store level, companies are intensifying their efforts to improve customer service.

Concern for customer service is hardly a new phenomenon among retailers. But only recently have information systems come of age and grown sufficiently user friendly to be applicable to the typical customer and reshape retail shopping behavior, Ferkenhoff said.

VIEWPOINT

EDITORIAL

Debunking parallelism

We have come to accept certain givens — safe assumptions — in the worlds of science, business and computers. In science, $E = MC^2$ is a universally recognized premise. In business, who doubts that you lose money if production costs exceed sale prices? And in computers, garbage-in, garbage-out remains a basic rule learned in freshman programming classes.

But for every given in the computer industry, when the fall product announcement cycle is in full swing, there are a half-dozen other suppositions that many vendors would like us to accept as sureties. That decentralization is the only way to go is one that comes to mind. Another is that centralization is the only way to go.

Another such supposition is that parallel processing is the best way to do computing. The claim may prove to be true, but the proof still is lacking, particularly in the world of commercial data processing.

First off, those in the business of manufacturing parallel processors have not even been able to agree on a clear definition of this grand new form of computing. To some, parallel processing consists of running any two CPUs at the same time. To others, parallel processing means carefully breaking down a problem so that all parts can run simultaneously on anywhere from two to several thousand CPUs.

As a result, each vendor defines parallel processing to its own advantage, blithely announcing every enhanced or new system as the first or most powerful yet developed for commercial computing. Just exactly what "commercial computing" means, however, is also in dispute.

To *Computerworld* and many of its readers, commercial computing means payrolls, accounting, word processing, interactive banking machines and the like. A limited amount, if any, of an MIS manager's time is spent on the applications that parallel processing vendors claim are commercial — applications such as computer-aided design/computer-aided manufacturing and seismic analysis.

So, when parallel processing advocates state they are selling in commercial environments, it should be remembered that they usually are selling scientific or engineering systems into the corporate world.

This does not mean parallel processing has no future. The potential is there. Even the symbol of the commercial computing world, IBM, is toying with the technology as its designers develop a parallel system that may or may not ever hit the market. However, the success of parallelism in the commercial environment still hinges on the vendor's ability to develop software that efficiently handles general business tasks.

The burden rests on the shoulders of those vendors, which now must do more than quote outstanding performance numbers for CPU-intensive special applications. Those vendors must still prove that their systems can run a business on a day-to-day basis.

LETTERS TO THE EDITOR

Comparing product processing rates

William Inmon's article, "A new measure of software speed narrows DBMS buyer's choices" [CW, Sept. 8], is well researched and very illuminating. I agree with his contention that "the maximum transaction arrival rate [MTAR] represents a fundamental, measurable limitation of the software." However, I take issue with the priority given to the "max/max" rate in terms of ranking data base management systems' (DBMS) performance.

In his accompanying chart, Mr. Inmon states, "The products are ranked in order of max/max rates, which may not be achievable in many cases." If so, then why rank them in this way? Sheer speed may be of some academic interest, but in terms of transaction processing, the "mixed" MTAR more closely represents the production requirements of users in the real world.

The mixed transaction environment also more closely represents production-oriented systems that include full recovery capabilities and the enforcement of data integrity rules. The max/max ranking represents a test-room case that does not reflect the needs of DBMS users in terms of day-to-day processing requirements.

In any case, Mr. Inmon's work is a major step forward in finding ways to compare transaction processing rates among DBMS products. His efforts will enable users to make decisions based on technical merit, instead of marketing hype.

Ronald R. Hank
Senior Manager, Corporate Relations
Cincom Systems, Inc.

Software consumer vs. vendor

Michael P. Brownell's letter [CW, Aug. 25] was defamatory, if not downright libelous. It is a slur upon every software consumer to claim that, "Such licenses and laws validating them do not hurt consumers other than individuals desirous of performing an autopsy on the software to facilitate developing a competing package."

Mr. Brownell's choice of words was, inadvertently, quite apt. Frequently, the "autopsy" in question is just that: The consumer is attempting to determine the cause of death. Vendor support is frequently a joke, and even when someone condescends to answer the support line, if any, a customer who needs rapid problem resolution had better be prepared to do it himself.

Usually, examination of the code has been prompted by the "I cubed" factor, that is, documentation that is incomplete, incomprehensible or incorrect. The only ways to determine what the product does are by trial and error, looking at the code or waiting for someone to answer the support line. If someone finally answers the support line, he may not have any more information on the product than you do, and in some cases you may be charged for information like "I don't know either."

It is hypocritical for the author to refer to copyrighted code. U.S. copyright law explicitly grants the right to make archival copies and requires that the protected material be published. Clearly, if the purchaser is contractually barred from examining the program, it has not been published. Equally clear, the average "shrink-wrap contract" infringes upon the rights the U.S. copyright law grants to the consumer.

If Mr. Brownell's letter is an accurate reflection of the type of customer he is used to, they deserve each other.

Seymour J. Metz
Annandale, Va.

Preparing for relational fidelity

Now that Dr. Codd has developed a simplified checklist on how to reach that enviable plane of "relational fidelity" [CW, Oct. 14], the mainframe and minicomputer DBMS vendors must be scurrying to incorporate the requirements.

So why all the recent talk of vendor fidelity to the relational model? In my opinion, corporate information systems management should be more concerned with strategic data planning, the development of a comprehensive conceptual data model, the use of proper relational data base design techniques and the pending modifications necessary for existing applications to comply with DBMS enforcement of the domain concept, referential integrity and the other welcome constraints posed by the model. There are many tasks that can be undertaken today to ensure preparation for the "fully relational" DBMS of tomorrow.

By the time the major vendors have "fully relational" offerings, the question will no longer be, "Is my DBMS relational?" but rather, "Is my company ready for relational fidelity?"

Ben Bullock
Kawneer Co.
Atlanta

VIEWPOINT

Toys for tots or top guns: Considering high-tech ethics

Professionals in any industry encounter moral dilemmas specific to their particular profession. As an example, many Wall Street analysts have recently been forced to face the dilemma of existing on $100,000 salaries or perhaps twisting their ethics a bit and making $12 million more. Convenience store owners have to decide whether Hugh Hefner's monthly Bunnies can grace their newsstands in the near future.

The center of the computer professional's dilemma is the Strategic Defense Initiative (SDI) or "Star Ware" to those who favor monosyllabic phrasing. There is a certain aspect of Star Wars that touches home in the computer industry — the Strategic Computing Project (SCP) — which has been set up to provide the advances in computing that will make Star Wars possible.

There is a sizable number of companies associated with the SDI and SCP, including Lockheed Corp., Texas Instruments, Inc., Boeing Computer Services Co., General Dynamics Corp., McDonnell-Douglas Corp. and Grumman Corp. These firms employ vast numbers of engineers and computer personnel, some of whom are paid to work specifically on Star Wars systems.

Militaristic end results

A growing number of these people do not like the ides of working on systems whose end result is militaristic. They have asked for transfers to commercial divisions or simply left their jobs because of personal convictions.

Others have remained, believing that no other industry offers such leading-edge challenges as military technology. What else can they do, then, except moan about building the current version of The Manhattan Project?

Build toys.

By HARVEY P. NEWQUIST

You may laugh, but I am dead serious. How did high technology get into the mainstream? Primarily through such decidedly low-tech pastimes as video games and such commodities as calculators. These days big bucks are put into the most decidedly low-tech creation of all time — the teddy bear.

Look at the Teddy Ruxpin dolls. This 1980s version of lowly stuffed toy bearing Theodore Roosevelt's name employs tape and microprocessor technology to create a doll that moves its mouth and blinks its eyes in synchronization with preprogrammed cassettes. If you think this is unimpressive, try stuffing a printed circuit board into a rag doll and then making it appealing enough for 4-year-olds to cuddle up to it.

Combining brains and bucks

Cashing in on this new technology frontier, Nolan Bushnell and Steve Wozniak are teaming up to combine their brains and bucks to produce high-tech toys. Bushnell, you will recall, gave the world its first video game in the form of Atari Corp.'s Pong. Wozniak oversaw the creation of the world's first mass-marketed personal computer at Apple Computer, Inc.

Not to be outdone, Audec Corp. of Saddlebrook, N.J., and INTV Corp. of Torrance, Calif., are joining together to create a toy panda that responds to children's voices. Dubbed "Sing Sing," the toy will employ voice recognition and voice synthesis gear to "hear" and then "respond" to a particular set of commands.

Other functions will include tape storage and playback of stories and educational lessons.

The cutting edge of technology is actually two edges. Fortunately, they exist at two separate ends of the production spectrum. At one end is Star Wars (which was actually the name of a childlike fantasy movie, wasn't it?). Working at this end of the spectrum entails some moral decisions about the ultimate use of the computer product.

On the other end is high-technology implementation for the masses. There is not too much sleep to be lost over the end use of the product, although at more than $60 a pop, you might want to consider the economic morality of toy prices.

'Intelligent' commodities

Both ends of this spectrum are attempting to make their respective commodities more "intelligent," to the point where tanks can make battlefield decisions and polyfoam animals can respond to children's questions.

The latter — the category including high-technology toys and other such mass market products — does, in fact, offer certain computing professionals an alternative to working on potentially destructive military systems.

To start with, these professionals could focus on adding Star Wars technology to Cabbage Patch Kids. Who knows? If they are successful with that, they can work their way up to G.I. Joes.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

As the industry evolves, be creative and responsible

As I make my rounds through Atlanta's DP and MIS organizations, I hear a lot about how business is not very good. Decisions are being postponed, evaluation cycles are extended, sales are down. In some cases, there are actual cutbacks and talk of "getting rid of the fat." IBM reports profits are down 8% from last year and high-tech companies are generally depressed on the stock market.

We talk about the reasons. "We are in a recession that nobody knows about. Companies are postponing decisions until the effect of the tax law is known. They are writing off everything this year and getting it over with all at once.

"People are waiting to see what the next generation of hardware and/or software brings. Companies can no longer compete with the Japanese. There is more competition for what business there is." These are all good, valid reasons that are well considered and well developed.

But none of these reasons get to the heart of the matter. Until we understand where we are in the industry's evolution, we will not be able to cope effectively with the problems.

Data processing got its start as an extension of the accounting function and rather quickly gained an identity of its own, even though it usually continued to report through the accounting department.

At this stage, DP was not at all popular. There was much resistance to automation, but the data processing people usually won out in the corporate political wars. Nobody could speak the language well enough to fight back and minor miracles were happening on a lot of fronts.

The bandwagon

Then came the bandwagon. Academic institutions dignified the industry with courses of study and new degrees. Technical schools, legitimate or otherwise, sprang up. The media could talk of little else. High-tech stocks were up and venture capital was plentiful. We were the white knights, the solution to all ills. Besides, the general public, as well as general management, did not know what questions to ask. The environment was such that the technical guru, unburdened by a business background, could call the shots.

Then came the salesmen. They, too, thought it a wonderful world of technology and promoted their products without reservations. Few people were really dishonest or malicious in their representations.

It was just that the industry believed its own press and thought that all things were possible to those who believed and who were willing to work 70-hour workweeks.

And what happened? There wasn't a sudden crash so much as a slow, smoldering disillusionment. Computer systems did not come in on time, the new breed of computer science graduate was not willing to sell his soul and leisure time for promises, and general management developed the temerity to have opinions of its own.

And then came the personal computer complete with independence and children's academic foture all wrapped up in one in expensive machine.

READER'S PLATFORM

By JACKIE M. REYNOLDS

But, PCs did not resolve the world's problems in one fell swoop. Instead, they sat on people's desks — and sat and sat. Decision makers became angry and resentful of empty promises.

The ironic other side of the coin was that when the poor, hapless user did learn how to make use of his desktop resource, he frequently discovered that he could develop in a matter of days a system that he had been told would take months or years on the mainframe. It all added up to two paradoxical phenomena — disillusionment and computer literacy.

The new breed of manager

Coincident with the onset of the age of the literate and cynical user, systems began to reach maturity. Computers were already handling the necessary, "easy" functions and doing them relatively well. It became difficult to convince the new breed of manager that he really did need a new inventory system when the one he had was working fine.

Further, that same manager was not interested in all the expensive, unnecessary frills. He had been burned too many times.

This is where we are now. The industry has come full circle to those early days of "show me." And what are we, the once-inspired workers, to do with our poor, deflated industry? Was all the energy and vitality an illusion? Absolutely not.

Technology alive and well

I sit here using a computer that has many times the capability of the first or even second or third mainframe I ever used. When I woke up this morning, my coffee was already made, and I just heard a beep from the kitchen that tells me the bacon is cooked. When I leave later in the day my telephone will be answered automatically.

Indeed, technology is alive and well. And where there is this much technology, there is ample room for creativity and success. However, the real difference is that this time around, creativity must go hand in hand with responsibility.

We must cost-justify, deliver on time and *speak English*. We can be forgiven the mistakes of our youth if we will settle for slow, careful and planned growth.

Reynolds is president of DXI Corp., a contract services and consulting firm in Atlanta.

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HARD TALK
James Connolly

Is Burroughs losing users?

It probably isn't time for company executives to head for the lifeboats — in fact, the alarm may be the result of an innocent coincidence — but a survey of Burroughs Corp. users raises some interesting questions for the Detroit-based mainframe vendor.

The survey says that 18 out of 100 Burroughs users are committed to converting their mainframe operations to other vendors' equipment. In addition, those users looking at conversions say Burroughs' acquisition of Sperry Corp. won't deter them from switching vendors.

The August telephone survey by Framingham, Mass.-based International Data Corp. (IDC) doesn't mean that 18% of all Burroughs users are jumping ship. IDC research analyst Donald C. Bellomy warns that the 18 pending conversions uncovered by the survey may be the only planned conversions for the more than 900 large-scale Burroughs systems installed in the U.S.

But one has to hope that Burroughs will take a close look at the meaning of that conversion figure, just in case it is even close to being representative. Fortunately, Burroughs officials have been in contact with IDC to determine whether they are facing what IDC calls "a serious erosion of the Burroughs mainframe base."

However, Fred R. Meier, Burroughs' vice-president for program management, questions IDC's conclusions and notes that the IDC report emphasizes the negative while downplaying users'

See IS page 20

Connolly is Computerworld's senior editor, systems & peripherals.

Lee Data expands 3270 line

Adds communications unit, terminal, emulation

By Rosemary Hamilton

MINNEAPOLIS — With a series of announcements last week, Lee Data Corp. extended its IBM 3270-compatible product line by introducing a communications processor, a terminal and two emulation packages.

The Model 525 is the industry's first communications processor to provide remote IBM 3270 and 3270-compatible terminals with access to T1 transmission lines, Lee Data officials claimed. Priced at $19,185, the processor allows users to communicate with a host at the T1 speed of 1.544M bit/sec.

The processor supports up to four T1 lines and up to four remote Lee Data controllers simultaneously, allowing up to 128 terminals to communicate with a host at one time. The vendor will also provide the Lee Data Expander option for the Model 525, which reportedly allows up to four remote controllers to be connected to a single T1 line. The Expander costs $1,500.

Along with the T1 processor, the vendor announced support of the CCITT X.25 protocol for packet-switching public networks. The combined communications capabilities now give Lee Data users a broad range of networking options, the vendor said.

The Model 1179 color terminal, announced last week, is a plug-compatible version of the IBM 3179 interactive terminal and functions with IBM or IBM-compatible controllers, the vendor said. With a 14-in. screen, it operates in either a four-color or seven-color mode. It costs $1,865.

A Hewlett-Packard Co. Model 2624B terminal emulation package was announced for Lee Data's Model 1222. When connected to a Lee Data controller, the Model 1222 can display up to four on-line host windows, representing from one to four IBM or non-IBM central processors. With the emulation package, which costs $100, users can reportedly simultaneously display IBM and HP host sessions.

See LEE page 22

Tandem POS net controller out

By Jeffry Beeler

CUPERTINO, Calif. — Tandem Computers, Inc. has joined two software houses in announcing a point-of-sale (POS) network controller, offering the fast-growing retail industry an alternative to NCR Corp.'s POS front ends.

The product, Store Link, combines Tandem's processors with software modules from Signorum, Inc. and LeRoux, Pitts and Associates, Inc.

Introduced at the National Retail Merchants Association Conference in Anaheim, Calif., Store Link is being used at the Newark, Calif., headquarters of Ross Stores, Inc., a soft goods retailer with 160 outlets.

Since becoming the product's first user, Ross has cut in six the time involved in formatting the sales transaction data it receives electronically from store cash registers, according to Peter Hart, the company's MIS vice-president.

Store Link has also enabled the chain to enhance its electronic credit authorization capability with monitoring and management functions that were lacking in its previous NCR POS network controller, Hart said.

Announcement of the Tandem-based product comes at a time when the POS market sector is growing three times faster than the industry as a whole, according to Dataquest, Inc. analyst Kimball Brown.

Steady decreases in transaction processing costs and a recognition of information technology's strategic value are heightening the appeal of real-time systems for retail chains. Compared with traditional store-and-forward environments, real-time POS networks allow users "to serve the customer more effectively and to know a lot better where they currently

See TANDEM page 22

NEW THIS WEEK

- Applied Digital Data offers DEC VT220-compatible terminal

For more on this and other new products, see pp. 73-83.

INSTANT ANALYSIS

"I've been with this company for 30 years, and I've always been fighting that one. I'm not sure that it is any worse than before. If anything, it seems to have been abating in recent months."

— Fred Meier, vice-president, Burroughs Corp., on whether users want all-IBM DP shops

Boeing plots to furnish users with supercomputing capability

Joins forces with Scientific Computer

By Jeffry Beeler

SEATTLE — Boeing Computer Services Co. has signed an agreement to furnish software for and jointly market a start-up company's near-supercomputer. The pact is a result of Boeing Computer's attempt to provide users with mid-range supercomputing capabilities.

Under a strategic alliance with Scientific Computer Systems Corp., Boeing Computer will adapt COS 1.13 to Scientific Computer's SCS-40, which reportedly provides one-fourth the power of a Cray Research, Inc. X/MP-1 supercomputer. COS 1.13 is the public domain version of the Cray operating system.

The pact also allows Boeing Computer to sell its own scientific and engineering application packages with the SCS-40 and calls for the company to provide the machine's users with training and support services.

Since consummating the agreement, Boeing has placed an order for two of San Diego-based Scientific Computer's processors. One of the units will be used to run benchmark tests for prospective SCS-40 customers. The other will be used for porting COS 1.13 to the near-supercomputer and for developing updates to mirror future releases of the Cray control program, according to Willie Aikens, director of Boeing Computer's executive programs.

Boeing plans to buy additional SCS-40s and install them in its five U.S. data centers, where they will be available for time-sharing services for internal and external users, Aikens said. The machines will complement the engineering and scientific time-sharing service that the firm's data centers already provide through their existing Cray supercomputers.

Boeing Computer is also considering a plan to place SCS-40s in some of its in-house user departments, where the processors would serve as dedicated supercomputing resources, Aikens said.

"One key to our alliance with Scientific Computer Systems is that we're trying to move our users from our Crays to the SCS-40s," he explained. If the partners succeed in their aim, a sharp division of labor will emerge between the two processor categories: The Crays will continue to specialize in brute-force number crunching, while the burden for doing relatively lightweight vector processing jobs such as refining preliminary models will shift to the SCS-40s.

"What has always been missing in Boeing's supercomputer strategy is something in the middle range," Aikens said, adding that Boeing is addressing that shortcoming with the SCS-40.

To a casual observer, the Scientific Computer-Boeing Computer alliance may seem like an anti-Cray move, according to Robert Schuhmann, chairman of the 3-year-old near-supercomputer supplier. But in fact, the partnership is expected to stimulate demand for full-scale supercomputers by making low-cost vector processing power available to users who previously could not afford it.

Is Burroughs losing users?

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general satisfaction with Burroughs.

The IDC survey was a poll of 100 Burroughs and 100 Sperry users and was intended to elicit the users' opinions about the merger, their vendors and whether the users saw the merger affecting their mainframe acquisition plans. In general, the respondents voiced satisfaction with the vendors and confidence that the companies' different architectures would be maintained at least through 1991.

In addition, 98% of the Burroughs users and 97% of the Sperry users said the merger wouldn't adversely impact their acquisition plans. However, they also said the merger wouldn't have a positive impact on their plans. This is where the 18-conversion number comes into play.

Bellomy says that IDC wasn't looking for a figure like that when the survey began. He says users were asked to cite a percentage of probability of their converting from Burroughs or Sperry to another vendor. The question was only a prelude to asking whether the merger changed their plans.

The surprise, Bellomy says, was that 18 out of 100 Burroughs users said they were 100% sure of converting prior to the merger. The ghost that Bellomy sees behind that figure is IBM. He notes that five of the 18 sites are all-Burroughs shops, while 11 also had IBM mainframes installed.

Bellomy speculates that what Burroughs, like so many other vendors, is encountering is that their customers have trouble justifying to their own bosses the acquisition of non-IBM systems. Another concern for Burroughs is that some of the potential lost customers are in markets that Burroughs emphasizes, such as government and banking, according to Bellomy.

"One of the odd results of the survey is that I actually came away with a more positive feeling about the merger than before," Bellomy notes. "If I were [Burroughs Chairman] Michael Blumenthal and I got a sense of this kind of leakage, I would try some kind of drastic move."

In defense of Burroughs, there are several caveats to keep in mind. First, some of the users who plan to move to other vendors are running older B6800 machines, which Meier says aren't even considered large systems any longer.

Meier also notes that earlier surveys and portions of the IDC report show Burroughs users to be satisfied with their systems.

"We know of 18 customers who have been leaving us for the past five years, and they still haven't left us. IDC implies that 2% of our base is leaving us, but I don't even know who those 18 are. If they were 18 brand-new ones that we didn't know about, I would be concerned," Meier says. He maintains that Burroughs has increased its user base by 50% in terms of the number of processors installed during the past five years.

Regarding the IBM-only policy of some DP shops, Meier says, "I've been with this company for 30 years, and I've always been fighting that one. I'm not sure that it is any worse than before. If anything, it seems to have been abating in recent months."

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Tandem net controller out

From page 19

stand," Brown said.

Developed under Tandem's 18-month-old Alliance partnership, which offers software houses incentives to write vertical applications for the vendor's CPUs, Store Link embraces three main program modules.

A module created by Signorum is a network manager package allowing Tandem processors to play the same role in a POS network as NCR's Stores retail system.

Situated physically between a retail chain's host and a network of NCR 751 in-store controllers, the network manager receives sales transactions via telephone lines from remote cash registers.

The front-end processor formats transactions and forwards the results to the user's main CPU, according to Susan Hailey, Tandem's retail industry market manager.

Records transactions directly

Unlike Stores, a system in which incoming data is collected first on tape and then transferred to disks for formatting, Tandem's Store Link system records transactions directly on a direct-access storage device for immediate processing.

A second Store Link module, developed by LeRoux Pitts, provides Tandem front ends with electronic access to an assortment of outside credit and debit authorization services.

The third software component was developed jointly by Signorum and LeRoux Pitts and stores merchandise prices centrally on a local microcomputer or a remote host.

Under the network management package, sales transaction messages originate at cash registers in Ross outlets and are sent to NCR 751s in each store.

From the 751s, the data goes to a three-processor Tandem TXP in Ross's headquarters and is stored on disk.

Formatting easier

In the past, sales data went first to tape for temporary storage. At day's end, according to Hart, the tapes were dismounted from Ross's NCR 8270 and 9020 front-end processors, transported manually to the store's Hewlett-Packard Co. HP3000 Series 68 host and transferred to disk to be formatted in batch mode.

Hart said, "With six 8270s and 9020s in-house, our total formatting could easily take three hours per night. The delay left us only a very small window within which to bring our sales order system back up by the following morning." Store Link made the nightly formatting tasks virtually disappear, he said.

Store Link's program modules can be acquired directly from Signorum and LeRoux Pitts for $125,000.

Lee Data expands line

From page 22

For its Model 2131 terminal, the vendor is offering a Digital Equipment Corp. All-In-1 screen formatting option.

With this option, users can display data in four separate formats that vary in the number and width of lines. Along with the expanded formatting, options for a windowing capability and asynchronous support of the DEC VT52, VT100 and VT132 terminal emulation are also available.

Lee Data also reduced the entry-level price of the Model 2131 terminal, which now costs $1,950. The Model 2131 with All-In-1 capability costs $2,265.

The asynchronous support costs an additional $100, and the windowing capability costs $300. A terminal with the All-In-1 formatting option, the windowing capability and asychronous support is priced at $2,765.

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

VAX market draws crowd

"Four years ago, our venture capitalists and even our own sales force was saying there isn't enough opportunity in the VAX marketplace. We have to get into the IBM world," recalls Kenneth Ross, president of Ross Systems, Inc. in Palo Alto, Calif., in a recent interview.

Ross finds it ironic now that large IBM mainframe software vendors like Cullinet Software, Inc. want to get into the fast-growing VAX marketplace. "Now we see multiple $100,000 opportunities out there. Believe me, we didn't see them two years ago," says Ross, whose company garnered $9 million in revenue last year in VAX financial applications.

Ross Systems is one of the few companies that has devoted itself to VAX software and may emerge as one of the beneficiaries of the current voracious appetite for Digital Equipment Corp. machines. Another that comes to mind is Ask Computer Systems, Inc. of Los Altos, Calif., a vendor that migrated its Hewlett-Packard Co. manufacturing applications to the VAX several years ago.

General Electric Co. subsidiary Software International Corp. of Andover, Mass., is believed to be quietly positioning itself for a run on the VAX marketplace.

Oracle Corp. and Relational Technology, Inc. are also likely winners with their SQL-based data base management systems. Henco Software, Inc. of Waltham, Mass., another established sup-

See VAX page 30

Babcock is Computerworld's senior editor, software & services.

IBM plans to expand CICS multiterminal capabilities

By David A. Freedman

LOS ANGELES — IBM foresees its largest customers wanting to use CICS for transaction processing on a much larger scale than currently possible and is committed to expanding CICS's capabilities, according to Guy Smales, an IBM CICS business planning strategist.

Smales, an 18-year veteran of the CICS development laboratory in Hursley, England, made his remarks at the recent IBM-sponsored CICS Technical Conference in Los Angeles, attended by 870 CICS system specialists and managers. Smales warned that his address, titled "CICS into the '90s," did not constitute a product preannouncement and that the CICS improvements were not targeted for specific delivery dates.

IBM sees the need to enlarge the terminal carrying capacity of its well-established teleprocessing monitor to handle such on-line transaction processing as home banking, videotex shopping and point-of-sale fund transfers, Smales told the group at its closing session.

Although an exact limit to the number of terminals per CICS system was not stated, Smales made it clear that IBM envisions system capacities greater than those of any system in existence today. CICS systems with as many as 100,000 terminals processing 500 transactions per second through multiple CPUs may be needed in the future, Smales said.

In addition, such systems must be able to add terminals and other devices without the necessity of taking the system down and reinitializing it, as was required with CICS prior to Release 1.7. With the addition of Resource Definition On-Line facility, CICS operators are able to add terminals and programs to the system without first taking it down. According to Smales, additional CICS resources, such as files, printers and other devices, will be included in Resource Definition On-Line in future

See IBM page 30

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- Chi/Cor Information Management offers Offsite Data Auditor

For more on this and other new products, see pp. 73-83.

INSTANT ANALYSIS

"The technology and promise of expert systems are not sufficiently alluring to entice the customer to disrupt his entire organization."
— **Peter M. O'Farrell, consultant, Technical Marketing Associates, Inc., Sudbury, Mass.**

SOFTWARE NOTES

Booming Oracle looks farther afield

Oracle Corp., with revenue expected to grow from $55 million in fiscal year 1986 to $115 million in 1987, is making plans to expand beyond its SQL-based **Oracle** product. It will try to move into related business areas, selling financial applications that run with its relational data base management system.

■

Cullinet Software, Inc. paid 40% more for its recent acquisition of **Esvel Co.** than the originally announced price, according to an E. F. Hutton & Co. software industry research report. Es-

See NOTES page 31

Wang-to-IBM VS user link out

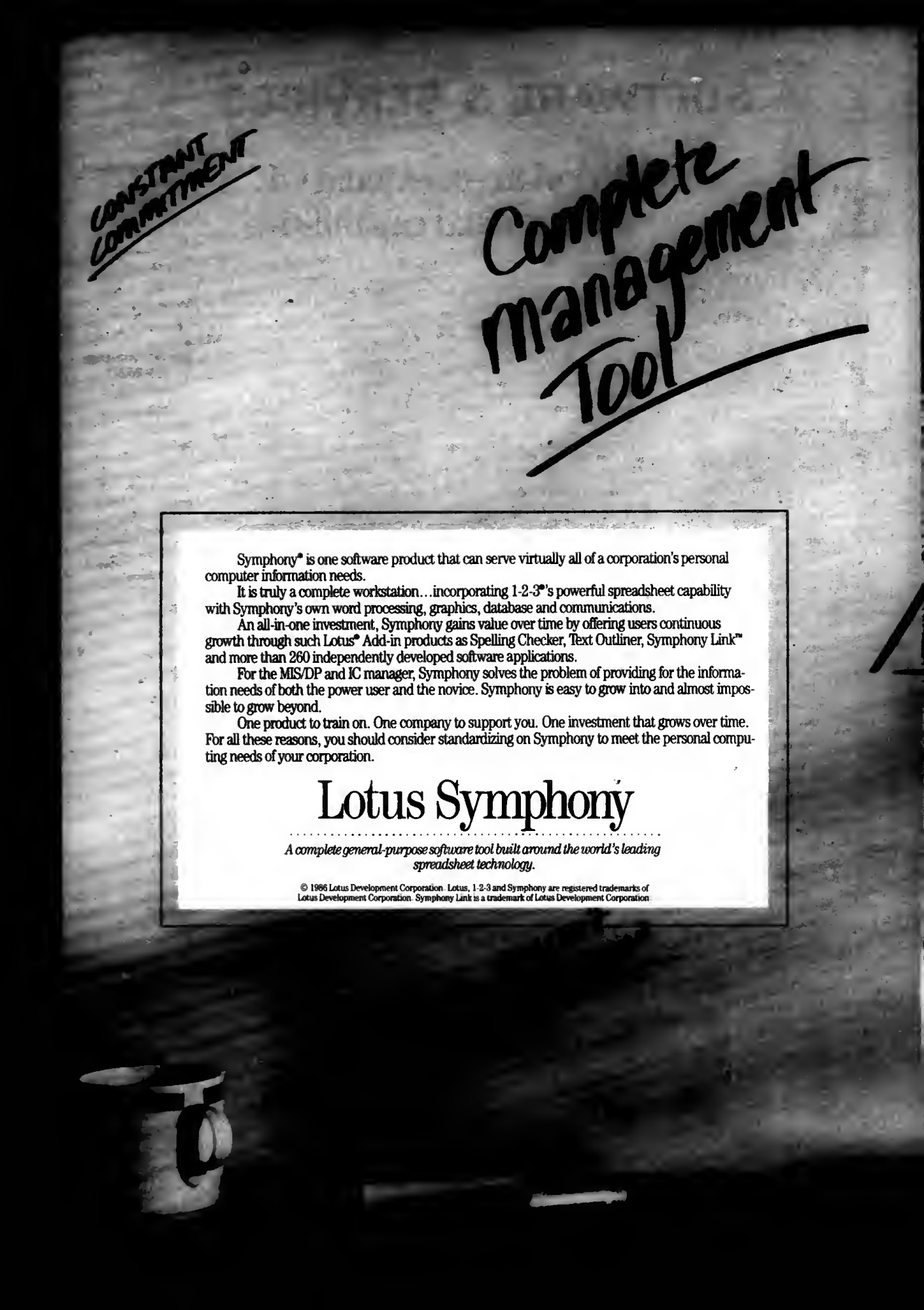
By Eddy Goldberg

LOWELL, Mass. — Wang Laboratories, Inc. recently announced the PACE/Cullinet Connection, a software package that will allow Wang VS users to retrieve data from IBM mainframes for use on departmental-level VS systems.

The package gives users of Wang's Professional Application Creation Environment (PACE) relational data base management system direct access to Cullinet Software, Inc.'s IDMS/R data base and IBM's VSAM files via Cullinet's Information Center Management System (C/ICMS).

"Essentially, it makes Wang more viable as a departmental computer," said Ellen Staelin, senior software consultant at International Data Corp. of Framingham,

See WANG page 31



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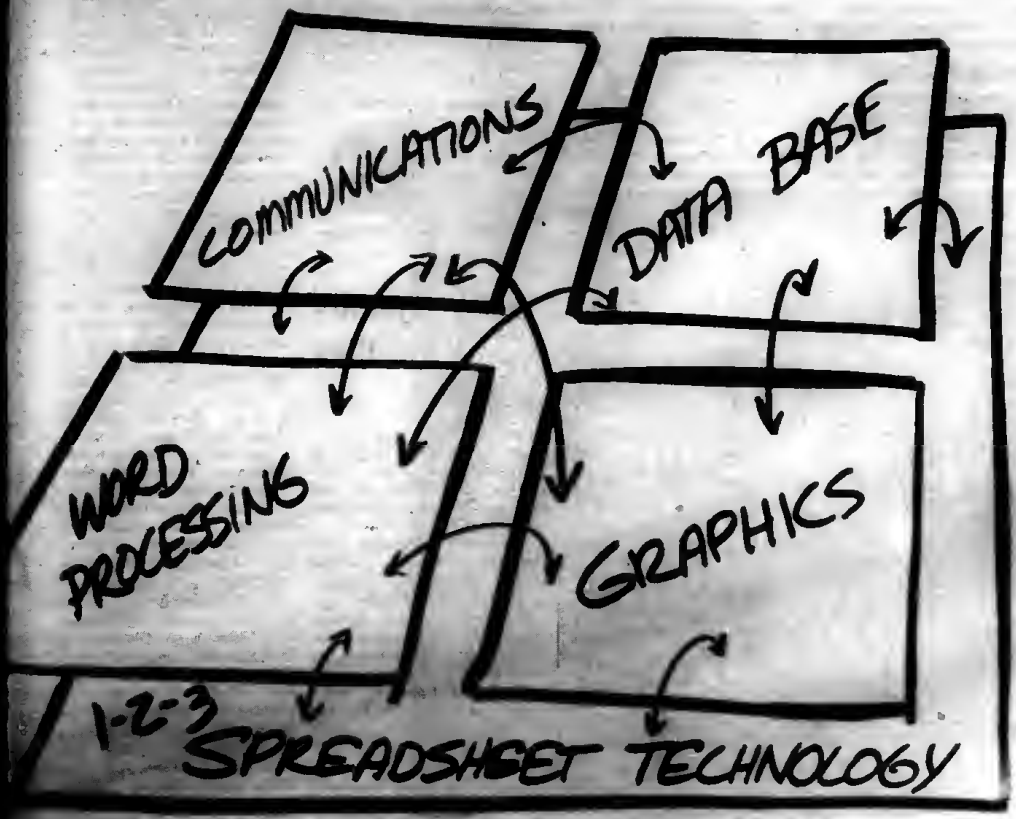


SYMPHONY ADD-INS → SPELLING CHECKER → TEXT OUTLINER → SYMPHONY LINK

VAX goes to decentral DP

From page 27

plier to the minicomputer market, may also be well positioned with its relational data management system, Info.

Beyond this small group, however, it is difficult to say which among the software companies is benefiting from DEC's success. Surely DEC itself is, given the high regard for its VMS operating system, All-In-1 office automation and Decnet. But most DEC software is viewed like IBM's — it comes from a company that is mainly interested in moving hardware.

Cincom Systems, Inc. in Cincinnati is a potentially strong player in the VAX market, given its fourth-generation language, Mantis, and its ability to move applications through Mantis between VAX and IBM mainframe data base management systems.

Sales ability questioned

Software AG of North America, Inc. in Reston, Va., has a similar strength with Adabas and its fourth-generation language, Natural, but the question remains how much software these traditional mainframe vendors can sell in the VAX marketplace.

In short, is the VAX being used for data processing functions alongside the mainframe, therefore requiring traditional data processing applications, or is it being used in DEC's traditional scientific, engineering and manufacturing markets?

Cincom's President Dennis Yablonsky says much of his company's 10% to 15% of revenue represented by VAX software sales will be in manufacturing applications.

"Two years ago, 80% to 90% of our manufacturing applications were sold into the IBM environment. Today 80% to 90% of it is going to users of the VAX. There's been a very rapid shift away from IBM," Yablonsky says.

Established market

But manufacturing is still DEC's established marketplace. What about data processing? On the departmental level where a department machine is controlled by local users, Yablonsky says, DEC is serving as a traditional DP machine. "We don't see much activity in the VAX in headquarters operations. But banks and insurance companies, colleges and universities and government agencies are using the VAX at the departmental level" for accounting and other applications, he says.

Sales of Cincom's Mantis and its relational product for the VAX, Ultra, grew at a rate of 38% during the past year and are expected to top 50% during the coming year, again indicating departmental use of the VAX, he says.

Ross says his company's revenues are up 55% this year on the strength of sales to midsize companies and divisions of large companies.

Because of DEC's financial strength, it is viewed by MIS managers as a safe buy, much like IBM has been, and they are considering it for traditional DP purposes at a level below the central mainframe, Ross explains.

"There used to be Big Blue. Now there's two," he says.

IBM expands CICS abilities

From page 27

releases of CICS.

He added that it will be necessary to revise IBM's IMS so that "CICS and IMS can come up and down independently of each other."

Acknowledging that storage violations are a major cause of CICS crashes, Smales said one solution may be "fencing off the system code from the application code." A storage violation occurs when a programmer exceeds allotted memory space and stores data over the application or CICS control code adjacent to the virtual memory area. When system code is violated and that code is called to run CICS, the system crashes, according to CICS users.

Another guarantee against system failure would be the ability to run CICS on multiple, or tightly coupled, processors, on which "execution of various parts of CICS takes place in various engines," Smales said.

With true functional transparency for Inter Systems Communications (ISC), which manages CICS running on two different processors, and Multi Region Operations (MRO), which manages two CICS jobs on one processor, a hardware or software failure in one CICS application could be isolated from others.

Such protection, however, would not be available for the older macro-level applications, which were generated to run with CICS in the first few years after its 1969 introduction, Smales said. Macro-level programs have been largely superceded by command-level applications, users say.

Freedman is president of Freedman Consulting, Inc., a CICS education and software consulting firm in Philadelphia.

Another speaker at the conference, Julian Jones, manager of CICS product support and testing at Hursley, said IBM was not ending its existing support for Macro-level code but made it clear that future enhancements to CICS will be available only through the command-level interface.

Jones acknowledged a problem in the release early this year of CICS 1.7, when the HANDLE CONDITION NOT OPEN of command level did not function as in previous releases. Prior to Release 1.7, CICS opened files during initialization, with the exception of controlled access files.

When a user sought to read a file that was not open, the command detected the condition, prompting the CICS application to inform the user of the need for manual intervention. A system programmer could then open the file. With the release of 1.7, files were opened upon the first call of a user rather than during initialization, decreasing the start-up time for CICS, according to Jones.

But when a 1.6 or older program with the HANDLE CONDITION NOT OPEN statement encountered a controlled access file, a different code was returned to the application, indicating the file was "disabled." The disabled code frequently triggered an error condition that crashed the application, Jones said.

The problem was corrected by a CICS "refresher" tape supplied by IBM shortly after the 1.7 release.

IBM's gradual move to Object Code Only in its distributed CICS code will require installations to remove any customized changes that they have made, Smales said.

IBM has provided a way for users to customize CICS by providing a facility for CICS to invoke user exits at externalized locations.

Smales suggested the exits be used with CICS to avoid future maintenance problems when the move to Object Code Only is completed.

Wang-IBM link bows

From page 27

Mass. "Of the software independents, Cullinet has the largest DBMS market share. Wang is approaching the largest market." Staelin said there are more than 2,000 systems with Cullinet's IDMS/R DBMS.

The PACE/Cullinet Connection, scheduled for December delivery, will cost $5,000, $7,500 or $15,000 depending on the VS system used. In addition, it will allow Wang VS users to access extracts of VSAM files and of IBM IMS, IBM DL/1 and Cincom Systems, Inc. Total production data bases, according to senior product manager Jeanne Friedman.

The PACE/Cullinet Connection permits only downloading of IBM mainframe data. Staelin said uploading is technically more difficult because security procedures need to be integrated and because read and write capabilities must be provided. However, she added, "It's reasonable to offer things in stages. The next logical step is to offer uploading."

Cullinet assistance

Cullinet provided C/ICMS specifications and technical assistance to Wang, a Cullinet spokesman said. Comparable arrangements exist for other departmental systems, he said, with products for Digital Equipment Corp. and Data General Corp. computers already on the market. Connections to Hewlett-Packard Co. and Prime Computer, Inc. systems are in development.

Wang VS users are able to request information through menu selection screens provided by PACE. To the user, the Cullinet C/ICMS environment appears to be just one more PACE data base name selection in the VS menu format.

Queries are translated into a format that allows Cullinet's C/ICMS to supply the information, which is then presented to the user in a PACE format.

Transparent translation

The translation of data from the C/ICMS to the Wang VS environment is transparent to the user. "All the end user needs to know is the PACE data base name that represents the Cullinet environment and have the proper user ID," Friedman said.

The retrieved mainframe data can be combined with departmental-level information or used in Wang office automation and decision support applications.

Query retrieval data from different data bases also can be combined on the fly, Friedman said.

Notes: DBMS buys rights

From page 27

vel is the originator of the relational DBMS running on **Hewlett-Packard Co.'s Spectrum**. The fact that Cullinet went ahead with the acquisition "indicates both a determination on the part of new management to reposition Cullinet and the possibility that unannounced technology might surface at some later date," according to the report.

■

DBMS, Inc., the Naperville, Ill., developer of DBMS tools, has acquired the marketing rights to **Qint Database Systems, Inc.**, a relational DBMS for personal computers.

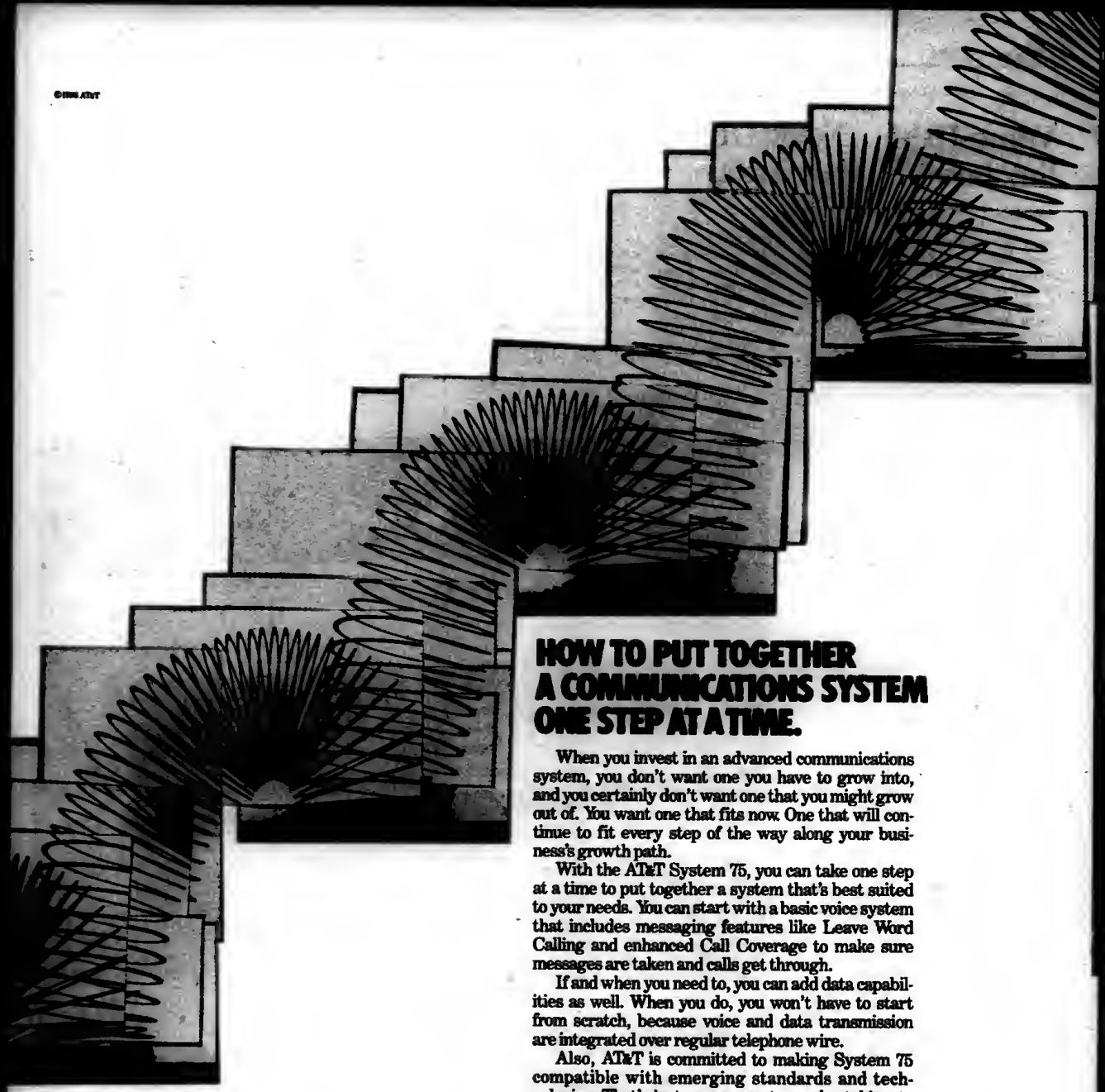
DBMS officials say they plan to incorporate Qint into an **SQL Workstation** that will have features of its mainframe counterpart, such as indexing and automatic recovery.

■

Telesoft of San Diego has signed an agreement to provide Ada software to **Sperry Corp.** for distribution to the U.S. Army for the Minis program. Telesoft will adapt its **Telegen2** Ada development system to the Sperry 5000/80. The Army is scheduled to purchase 1,800 of the Sperry minicomputers over a three-year period.

Communications Solutions, Inc. (CSI) of San Jose, Calif., will supply **Burroughs Corp.** with the communications software it needs for Ofisbridge.

Burroughs will license CSI's **Access/DIA**, an emulation of IBM's Document Interchange Architecture that provides access to IBM's Distributed Office Support System, and **Access/SNA**, which uses IBM's LU6.2 protocol to provide the transport layer for Access/DIA.



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Bharat Thacker

The move toward MAP

Manufacturing Automation Protocol (MAP), the emerging manufacturing communications standard, has been generating a lot of excitement recently as large firms like General Motors Corp. and Deere & Co. move toward working installations. This column discusses MAP's importance — particularly as the foundation for computer-integrated manufacturing (CIM).

The MAP/CIM ideal is a network that provides high-level communications among computers of various sizes and brands, along with a variety of programmable factory floor devices such as robots, programmable controllers and vision systems located throughout the factory.

MAP describes the network system that links everything together over a broadband backbone cable. CIM means using computers to integrate the manufacturing, design and business functions of an organization. It really describes concepts, strategy or a road map — not a system.

CIM is more than just automation. Integrating various automated functions is an important part of CIM. Why is CIM such a high priority for many manufacturers?

It is appropriate at this point to think about how computers and automation fit into the manufacturing environment. One way of looking at them is as a functional hierarchy. At the top level, the facility system can carry out

See MOVEMENT page 34

Thacker is a consultant at Universal Computer Applications of Southfield, Mich.

MAP/TOP group sees fiber-optic technology light

By Rosemary Hamilton

ANN ARBOR, Mich. — Fiber optics emerged as the next major media issue at the MAP/TOP Users Group meeting held recently, with AT&T announcing a Manufacturing Automation Protocol (MAP) research project involving fiber optics and another vendor announcing a fiber-optic-based MAP product.

The users group has an established broadband specification and a carrier-band specification that is about to be released for its set of MAP networking protocols, but no specification for fiber-optic cabling is available. Following the fiber-related announcements, the group said it planned to establish a special interest committee to discuss such a specification.

Nonetheless, the users group was also quick to disassociate itself from Codenoll Technology Corp., which announced a fiber-optic modem that it said is fully compatible with the MAP specifications.

According to Charles Gardner of Eastman Kodak Co., who is chairman of the MAP/Technical Office Protocol (TOP) Steering Committee, Codenoll had recently advertised for "MAP on fiber," which, he said, is a misuse of the term MAP.

"Advertising being done for MAP on fiber makes the public believe that the MAP group has a fiber option, and we don't, because the standards aren't ready yet," Gardner said.

AT&T announced its first MAP-related research project, according to AT&T spokesman Mark Siegel. If successful, the findings will be applied to AT&T's manufacturing facilities, he added.

Still in the planning stage, the project will involve a prototype fiber-optic modem developed by AT&T and MAP-compatible hardware and software supplied by Concord Communications, Inc.

"This is an experiment to test the uses of MAP in a fiber-optic environment," Siegel said.

See USERS page 35

Low-end PBXs bow at TCA show

Small-scale voice/data tools join product parade

By Stanley Gibson

SAN DIEGO — Joining a parade of products introduced at the Telecommunications Association's Annual Conference last week were small-scale digital voice and data private branch exchanges (PBX).

Siemens Information Systems, Inc. and Mitel Corp. were among those introducing low-end systems. These firms' goal is to sell a growing company a small, expandable system and then sell that customer upgrades in future years, according to George Newman, managing editor of "Computer Industry Report," a publication of International Data Corp., a Framingham, Mass.-based market research firm. "The goal is to get them early," Newman stressed.

Building a small PBX is also a simpler manufacturing task than building a large system, Newman said, suggesting that the several small companies that introduced systems can better perform the required engineering for a small system than for a large one.

Siemens Information Systems showed its recently introduced Saturn I. Intended to compete with the AT&T System 25 and Rolm Corp.'s Redwood, the voice and data switch is designed for installations of 100 lines or fewer. It is priced at about $400 per line with voice only and about $1,000 per line with voice and data, according to Siemens.

With a standard configuration of 128 ports, the system can grow to a maximum of 224 lines. Beyond that limit, the Saturn I can be upgraded to a Saturn IIE, Siemens'

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INSIDE

NEW THIS WEEK

- Applitek offers network interface unit

For more on this and other new products, see pp. 73-83.

INSTANT ANALYSIS

"The whole purpose of open network architecture is to make the same basic service elements equally available to both the divested Bell operating companies and their competitors. But we still don't know whether we'll have five basic services or 500."

— Wayne Masters, district staff manager, federal regulations, Southwestern Bell Telephone Co.

Distributed data net feature ties distant LANs

SUNNYVALE, Calif. — David Systems, Inc. recently announced a distributed data networking feature for its integrated voice local-area network (LAN) that allows users to connect multiple David Information Managers in different locations to a single network.

The David Information Manager allows users to simultaneously transmit high-speed Ethernet data, RS-232 terminal data, digitized voice and IBM 3270 data over standard, twisted-pair telephone wiring.

The distributed data networking enhancement allows users to connect geographically dispersed David LANs at distances up to 1.5 miles, via fiber-optic cable, or up to 2,000 miles, via T1 links, with the separate networks appearing to the user as one.

The feature allows David to target companies that have multiple sites but want the benefits of a single, high-speed LAN running over twisted-pair wiring, David's President and CEO Luigi Mercurio said.

"The key point from the user perspective is the possibility of implementing a corporate LAN or a very comprehensive data network starting from a very small nucleus, initially in a department, and gradually moving up according to specific needs," Mercurio said.

David's distributed data network also offers centralized maintenance and management. "If you distribute your network nationwide, there is the question of how you are going to manage it," Mercurio said. "At the same time [that] we are offering a very centralized network, we are offering centralized administration, including remote diagnostics."

Circuit boards and software allowing up to 960 Ethernet connections and 1,900 RS-232 connections to be networked via fiber-optic cable are scheduled for October delivery. The T1 version is scheduled for March 1987.

The circuit board and software for the fiber-optic cable is priced at $4,490, and a separate circuit board with software for T1 networking costs $6,150.

Movement toward MAP

From page 33

the functions associated with the front office: engineering design and long-range planning. Systems at the shop level perform material requirement planning, capacity planning and aggregate scheduling.

Finally, systems at the cell level can coordinate the activities of the workstations under their control to complete incoming shop orders. Each workstation coordinates the activities of the various pieces of equipment under its own control to execute the tasks issued from the cell.

Of course, the number of levels and functions performed at each level vary among implementations. But the basic CIM concept remains the same: Work areas are not islands, but interdependent components of the same manufacturing system. For example, incoming orders or changes to the existing backlog at the facility level have an effect on the lower levels as well. The shop level must respond to changes in the aggregate scheduling produced by the facility level; these changes filter down to the cells' dynamic scheduling.

Similarly, when a workstation within a cell reports that a piece of equipment is down for an extended period, this can affect scheduling at the shop level. This shows that there is likely to be significant interaction among the systems at different levels and that, possibly, various systems on the same level provide the desired functionality.

Through CIM, manufacturers hope to lower costs and achieve greater efficiency and quality control on the production line. MAP can potentially bring firms closer to the benefits of CIM by providing standardized communications among the different systems residing in various work levels.

Since no one computer system or vendor can provide adequate functionality at all levels, we need the multivendor communications capabilities of standard protocols such as MAP in order to link systems throughout a manufacturing site.

MAP seems to satisfy all of the communications needs discussed above, so it is a necessary component of the solution for CIM and manufacturing problems. However, merely implementing MAP will not necessarily solve CIM and manufacturing problems.

MAP protocols for low-level networking are almost in place, but higher level functions and system-specific interactions are still under development. And even when MAP is "complete," it will not encompass application-level communications such as the standardization of formatting for electronic data interchange.

This is analogous to the problem of two people located in distant cities who need to resolve a problem. Each of them having access to a telephone does not necessarily resolve their differences. The real solution to the problems of CIM and manufacturing is to understand your requirements and do the necessary planning and design to solve them around an industry standard like MAP. MAP is a tool for solving the bigger problem; it is not, however, the solution.

Users group sees the light

From page 33

Meanwhile, Codenoll Technology said its $1,750 fiber-optic modem is available and the users group's statement on fiber optics "hasn't affected the degree of interest" in the modem.

Ernest Raasch, vice-president and CEO, said there is a significant number of users with fiber-optic cabling who would require such a product. At the meeting, the vendor demonstrated its Codenet-3410 with equipment from Motorola, Inc., Intel Corp. and Industrial Networking, Inc.

Several other products and agreements were announced at the meeting:

- Data General Corp. said it will market the Allen-Bradley Co. Vistamap 802.4 product family for use with DG systems. The two vendors also said they will offer a product to link DG processors with the Allen-Bradley Data Highway baseband local-area network.
- Hewlett-Packard Co. is offering a MAP 2.1-compatible interface for its Series 1000 minis.

Low-end PBXs bow at TCA show

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next larger digital PBX, with an expansion limit of 800 lines.

James L. Beane, Siemens product manager, said he expects the under-100-line PBX market to grow 25% annually through 1990.

Mitel is expected to show its digital PBX, the SX 200 D, which performs simultaneous voice and data transmissions. It can handle up to 250 lines and competes against the AT&T System 25 and Rolm Redwood machines, a spokesman said.

Software links SNA systems to packet nets

Tool requires no extra hardware for conversion

By Elisabeth Horwitt

A software package recently released by Communications Solutions, Inc. enables users to transmit over packet-switching network services such as McDonnell Douglas Network Systems Co.'s Tymnet, using IBM's Systems Network Architecture (SNA) communications protocols.

"The advantage of our product is that it requires no extra hardware," Communications Solutions spokesman Steve Martinez said. "IBM's SNA-to-CCITT-X.25 interface requires a 3274 controller card. Most packet-switching vendors that support SNA require that their customers install a packet assembler/disassembler on premise to do the SNA-to-X.25 conversion."

X.25/Connect software runs in conjunction with one of Communications Solutions' other SNA products for IBM mainframes and Personal Computers. These products include Access/SNA Advanced Program to Program Communications, which supports LU6.2 peer-to-peer communications; Access/DIA, which supports IBM's document exchange protocols; Access/SNA 3270, which supports terminal emulation; and Access/SNA 3770, which supports remote job entry.

"We feel that the demand for public data network services is being boosted by AT&T's packet-switched offering and the increasing number of divested Bell operating companies offering packet switching," Martinez said.

X.25/Connect software can run either on a computer or on a server that provides a link to a packet-switching service for a group of computers. It is available immediately. A one-time payment of $10,000 allows the customer to add packet-switching connectivity to its entire installed base of PCs and mainframes running Communications Solutions' SNA software, according to the company.

NCR Tower delivers for Domino's Pizza

What could a chain of more than 3,000 pizza stores and a hospital management company possibly have in common?

Smarter business computers: NCR Towers.™

The Tower helps Domino's Pizza, the nation's fastest-growing fast food chain, to guarantee delivery within 30 minutes.

At HCA, the country's leading hospital management firm, over 1,000 Towers organize and coordinate the complex functions of each independent department into a smooth-running operation.

Obviously, the Tower is a very versatile computer.

The NCR Tower is actually a family of computers, ranging from a 2-4 user system to a departmental system. Or from a small business network to an international network of hundreds of users. Memory capacity ranges from one to sixteen MB. And for disk storage, from 25 MB to over 5.5 gigabytes. Networking and communications are easy because the Tower supports all major protocols, including SNA, X.25.

The NCR Tower offers a choice of operating systems: UNIX System V* and RM/COS* And every Tower model is designed with open systems architecture to work with industry standard hardware and software.

What's more, NCR backs the Tower with one of the world's largest service organizations. With 16,000 engineers on call, expert NCR service is as close as the phone. Which is another reason the Tower is a smarter choice. And why smart businesses have already chosen more than 22,000 NCR Towers.

To find out how the Tower can deliver for you, dial 1-800-CALL NCR.

And HCA's hospitals.

The NCR Tower.
Because smart businesses need smarter computers.

NCR

Leaders innovate.
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Leaders listen.
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Leaders have spirit.
Leaders have imagination.
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But most important,
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MICROCOMPUTERS

MICRO BITS
Mort Rosenthal

Critical view of software plans

In past weeks, the major software vendors, Lotus Development Corp. and Ashton-Tate, have finally offered their proposed solutions to the needs of corporate America.

Having descended from a mountain of indifference, the firms have at last recognized that customer concerns are real and that, if they do not address these problems, their products just might fall out of favor. Both Lotus and Ashton-Tate hope their respective plans will lead to direct relationships with large customers for sales or service.

This effort must be lauded. Large corporations deserve special attention; they require direct contact with manufacturers of the major products on which they have standardized.

Lotus's program, which is more comprehensive, covers copy protection, licensing, applications development, direct selling, electronic distribution, support and upgrades. Ashton-Tate's program concentrates on support and upgrades and includes the removal of copy protection from all its products. The Lotus program is confusing because it covers many seemingly unrelated issues without a lot of specifics; on the other hand, Ashton-Tate provides so many details on its offerings that the forest is not visible for the trees.

Support. Implicit in the support policies of both vendors is an attitude that support is a burden rather than an obligation. This attitude is clearly appropriate for both customer and vendor. But the vendors seem to be charging purely for economic reasons, rather than as a mechanism for providing better service.

The biggest problem with these sup-

See CRITICAL page 41

Rosenthal is chairman and CEO of Corporate Software, Inc., a firm specializing in selling software to corporations.

Trio to develop diskless PC

Hyundai to design $600, Intel 8088-based micro

By David Bright

Novell, Inc., Santa Clara Systems, Inc. and Hyundai Electronics have banded together in an effort to develop a diskless personal computer for less than $600.

The Intel Corp. 8088-based personal computer will include a network interface for tying into Novell's Netware local-area network (LAN), thereby at least halving the current price of a LAN node.

Santa Clara Systems, one of the few companies currently marketing diskless personal computers, will design the system, which should be introduced in the fourth quarter of this year.

Hyundai Electronics — a division of the Hyundai Group, the $13 billion South Korean conglomerate that also makes low-priced automobiles — will manufacture the system.

"By lowering the cost of hardware, we believe we will greatly expand the marketplace for all vendors of LAN services and products," said Novell Chairman Raymond Noorda.

Santa Clara Systems' diskless PC Terminal is currently priced at $1,295, and an interface card for adding stand-alone PCs to a network typically costs about $600. Santa Clara Systems President Tom Quinn cites two factors in the attempt to drastically reduce the price: gate array chips designed by his company and Hyundai Electronics' manufacturing capabilities.

The system will include programmable read-only memory, responsible for fetching the network operating system from other hardware in the network.

Forming alliances

Increasingly threatened by competition from the major systems vendors, independent LAN vendors must protect themselves by forming alliances to pool their resources, Noorda recently told *Computerworld*.

In addition, Noorda predicted a "merging of technologies" that will allow both systems and LAN vendors to coexist.

With major systems vendors beginning to offer their own networks with integrated personal computers, "there are no opportunities for [LAN] vendors in the major accounts anymore," according to Marty

See TRIO page 40

Grid enhances laptop keyboard, offers 10M-byte hard disk drive as option

By Peggy Watt and Douglas Barney

MOUNTAIN VIEW, Calif. — Grid Systems Corp. has added an optional internal hard disk drive and enhanced keyboard to its line of laptop computers.

Unlike the purchase of many desktop microcomputers, laptop machines are most often bought in bulk and distributed to users for specific applications. According to Grid, having a hard disk drive makes the distribution of application-specific laptops more effective.

"The hard disk drive enables our customers to create turnkey applications for their users. A company can purchase the unit with the hard disk, load up all the software and then distribute it to the users in the field," said Ed Murphy, a Grid representative.

The 10M-byte internal hard disk is a $975 option to the Gridcase Plus, which is available immediately, according to Grid. The $2,750 Gridcase Plus comes standard with an internal 3½-in. floppy disk drive, which is removed when a hard drive is added. The Gridcase Plus chassis also has a connector for an external 3½-in. floppy disk drive, the 1½-ib Pocket Floppy, priced at $295.

Also available with the Gridcase Plus are 128K bytes of erasable programmable read-only memory (EPROM), putting as much as 1M byte of application programs in read-only memory (ROM). Previously, 64K-byte EPROMs were used. All Gridcase models can accommodate up to 1M byte of ROM. Grid will also continue to sell its 10M-byte external hard disk drive for $1,450. Custom, as well as generic, software can be loaded into ROM, Murphy said.

The larger keyboard on the Gridcase Plus now includes a numeric overlay keypad and a separate row of function keys, of which there are now 12 instead of the 10 available in earlier Grid models.

See GRID page 40

INSIDE

NEW THIS WEEK

- Generic Software adds module to its CADD package
- C. Itoh Electronics offers 9700 dot matrix printer

For more on these and other new products, see pp. 73-83.

INSTANT ANALYSIS

"It is hard to say never, but I would probably say never."

— Jim P. Manzi, chairman of Lotus Development Corp., on when his firm will offer a pure site license

Dual-speed, IBM-compatible PC rolls out from Wyse

Micro has color graphics adapter

SAN JOSE, Calif. — Wyse Technology, Inc. has announced the Wyse PC Plus, a dual-speed, IBM Personal Computer-compatible system to be sold through both OEMs and value-added dealers.

The PC Plus is based on an Intel Corp. 8088-1 microprocessor and comes with two processing speeds — 9.54 MHz and the standard 4.77 MHz used on the IBM PC. It also includes a built-in color graphics adapter, two serial ports, one parallel port, a clock with battery backup and a choice of two keyboards.

One keyboard is IBM PC-style; the other is like that used with the IBM Personal Computer AT. International characters and symbols are also available.

Microsoft Corp. MS-DOS and GW Basic are both bundled with all PC Plus configurations.

The base configuration includes 256K bytes of random-access memory (RAM) and a single floppy disk drive priced at $1,265. The dual-floppy drive model comes with 640K bytes of RAM for $1,445, while the model with internal 20M-byte hard disk drive and 640K bytes of RAM costs $1,995.

Wyse sells a line of monochrome and color monitors separately, including enhanced graphics adapter-compatible and high-resolution monitors.

The new PC Plus effectively replaces the 8088-based, IBM PC-compatible Wyse PC introduced in 1985, although the earlier Wyse PC will still be sold to some OEMs. The PC Plus joins the Wyse PC 286, a PC AT-compatible system introduced earlier this year.

Trio develops diskless PC

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Gruhn, vice-president of The Sierra Group, a Tempe, Ariz., market research firm. And with companies like IBM, Digital Equipment Corp. and Data General Corp. "really pushing at value-added resellers that serve the middle ground, that squeezes the independent LAN supplier out even further," she concluded.

Grid enhances keyboard

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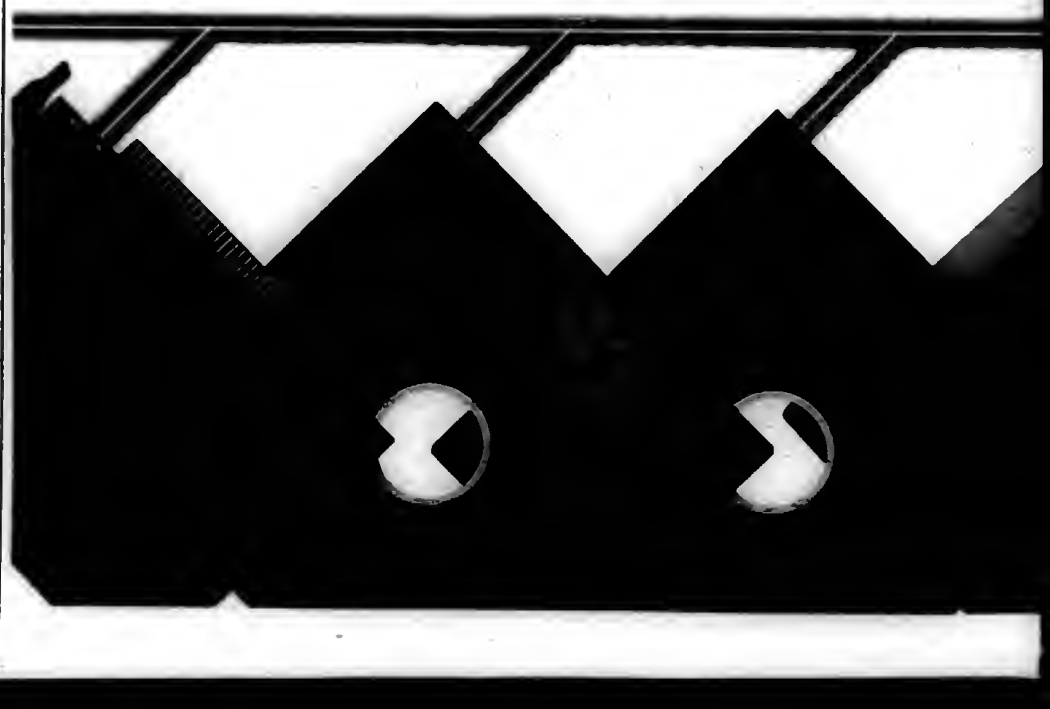
The Gridcase Plus, like other Gridcase laptops, is available with enhanced yellow liquid-crystal or light-emitting plasma displays. The newer model, similar to the existing Grid line, operates on a rechargeable battery pack.

The Gridcase line of laptops comes standard with 128K bytes of random-access memory expandable to 640K bytes, red-green-blue video output interface and one serial and one parallel port. Even models with the 10M-byte internal hard disk weigh less than 12 lb, according to the vendor.

Other options include an internal 300 or 1,200 bit/sec. modem compatible with Hayes Microcomputer Products, Inc. modems and an IBM Personal Computer expansion box for linking into a local-area network.

Volume purchase prices are available.



Critical view of software

From page 39

port programs is that the vendors' support has traditionally been poor.

Indeed, it is not clear how the support provided under these programs — so-called premium support — is different from that provided free of charge by existing hot lines.

If the support services answer questions more quickly, more politely and with greater sensitivity to the applications requirements of the end user, then the vendors will have provided a valuable service.

Apparently, however, both vendors are not sure that support alone will be enough to motivate customers to fork over the dollars, because both programs offer more than support. Ashton-Tate offers publications, conferences and beta copies. Lotus offers discounted companion products (like 1-2-3 Report Writer and HAL).

The two vendors have taken a radically different approach to charging for support. Ashton-Tate charges $4,000 for company-wide support. Lotus charges $150 for individual support.

Upgrades. Upgrades are an enormous logistical nightmare. At the same time, staying current is important. But problems develop when an upgrade is forced and unplanned, such as when a vendor introduces an incompatible product without continuing to provide the older version.

So the goal is to make life easier — to compensate customers while charging a reasonable fee for continued research and development and support.

In the mainframe world, an annual fee is usually 15% of the initial license; for 1-2-3 or Ashton-Tate's Dbase III, the fee is $75 to $100, assuming customers buy at list.

Direct Sales. Only Lotus has incorporated a direct sales effort into its program. Although its solution is not site licensing, it does address the needs of a select group of very large customers. Lotus will sell 500 or more copies of 1-2-3 or Symphony in a single order at a single time with a single shipment.

The price will be only slightly lower than aggressive prices available from distributors for smaller orders without a massive commitment. For this program to make sense, the customer must either have a very large immediate need or must be prepared to develop the overhead to warehouse, distribute and cost-allocate the units over time.

Lotus also offers electronic distribution from the customer's in-house mainframe. Here again, the commitments are large, the prices are not great and the up-front technical work is enormous. This solution is appropriate only for accounts that are willing to put in the extra effort to achieve the control offered by electronic distribution.

Copy protection. Copy protection has been a sore point for these vendors for a long time. Sure, it makes life difficult for users and sometimes prevents good system backup. On the other hand, it prevents the temptation to copy a product "just this once because I really only need it once in a while."

The threat to the vendors is not pirates. *They* already have bootleg copies. It is the person, who makes casual copies unaware of the illegality, who is posing the risk.

Ashton-Tate has taken the bold move of removing copy protection entirely. That represents a significant risk, and the decision was not made thoughtlessly.

Lotus's solution is different. For large companies that can demonstrate serious and enforceable mechanisms for preventing piracy, Lotus will remove copy protection.

It will be interesting to see how these programs evolve. One thing is certain. Within a year, we will all be responding to yet another set of programs — as well as an industry commentary on why the August announcements worked — or why they did not.

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Director of Management Information Services
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Executive Report

Edited by Glenn Rifkin

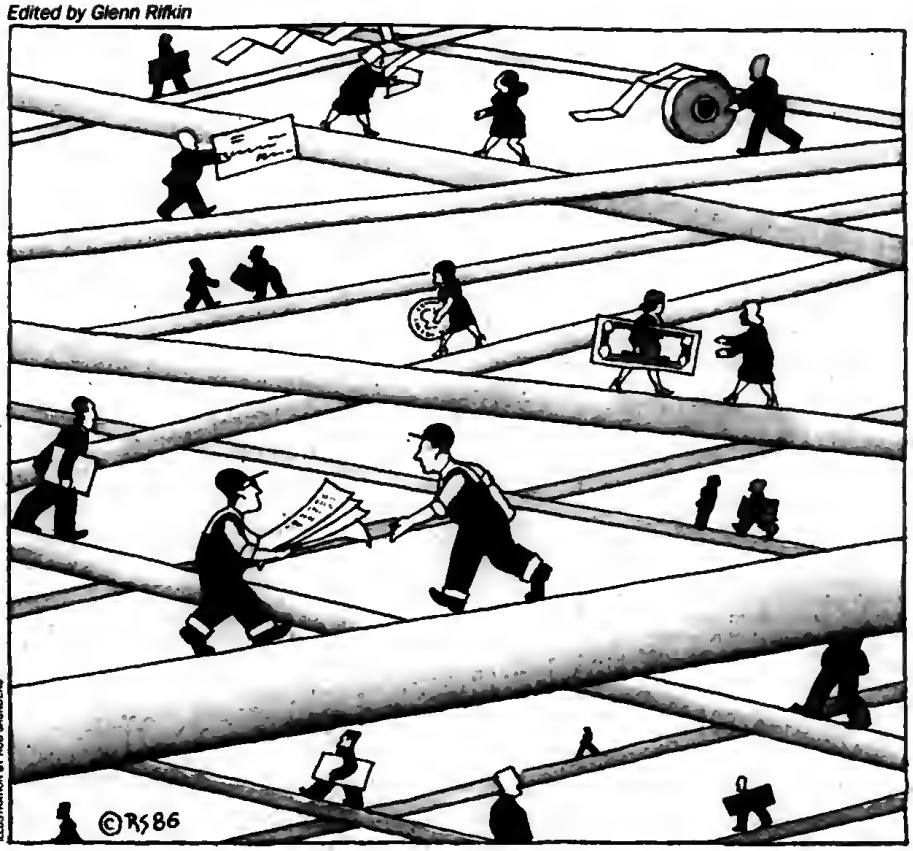

ILLUSTRATION BY ROB SAUNDERS

INSIDE

On-line transaction processing

Cost dropping while applications go blue-collar

By PHILIP J. GILL

Many things about the on-line transaction processing (OLTP) systems market are unclear, not the least of which is an agreed-upon definition of what constitutes an OLTP system or the market. What is clear is this: The market for such systems is growing and growing rapidiy, the types of applications for which OLTP systems are being used are expanding and many of those same applications are the products or services thatgenerate the bulk of revenue for the corporations that use them.

In large part, these current trends in the market can be attributed to an expanding application base. To begin with, OLTP systems no longer just handle white-collar, or service industry, applications, such as airline reservation systems, automated teller machines (ATM) or point-of-sale networks. In an increasing number of large companies today, OLTP has gone blue-collar, accommodating such diverse new applications as fire, police and medical emergency systems, process control and automated factory floor applications.

Certainly, service industry applications remain the bulwark of installations among companies in the Fortune 1,000. However, the ability of systems to rapidly access, update and/or alter on-line data bases instantaneously makes these systems well suited for many "new" applications as well.

Additionally, Sandra Gant, a vice-president at Infocorp, a San Jose, Calif., market research house, notes that hardware vendors, particularly Tandem Computers, Inc., the Cupertino, Calif.-based market leader in fault-tolerant systems, have been aggressively driving down system prices. Lower prices have meant that many users who might not have considered an OLTP system for their applications before are doing so now.

OLTP is nothing new or exotic; it has been around for quite some time. Nor is it, as some erroneously claim, a technology. OLTP is a proven method for providing real-time, on-line data processing capabilities and corporate data bases.

Beyond that, the definition of OLTP bogs down in a mire of vendor positioning and market researcher biases. One of the simplest and broadest definitions comes from Infocorp's Gant, who

Lower prices have meant that many users who might not have considered an OLTP system for their applications before are doing so now.

Gill, former editor-in-chief of Unix/World *magazine, is currently a free-lance writer on business and high technology. He currently lives in San Mateo, Calif.*

Applications go blue-collar

Continued from previous page

defines OLTP as "several users against a single data base doing on-line inquiry and update." (See story page 47 for an expanded definition.)

Because there are so many definitions and parameters concerning OLTP, market size becomes another confusing issue. For example, Infocorp estimates the market at $10.2 billion in 1985, growing to $23.3 billion in 1990. However, Frost & Sullivan, Inc., a New York market research house, says the market was about $18 billion in 1985 but will grow to $47 billion in 1990, and Dataquest, Inc. of San Jose says the market was $17 billion last year and will grow to $35 billion by 1990. A Tandem spokeswoman says the only certainty about the market is that it "is at least $10 billion and growing rapidly."

There is also considerable debate as to who constitutes the major market players after IBM. IBM dominates the OLTP market with a share in excess of 50%. No one debates that. What is debated, though, is who ranks second, third, fourth and fifth. Tandem says it believes it is second, as do some market research houses. Others say Digital Equipment Corp., the nation's No. 2 computer maker, is second, and still others say DEC is not a factor at all.

DEC's VAXs have clearly made an impact in transaction processing applications, but what is not clear is whether DEC has targeted the OLTP market specifically or just found itself being thrust into that role. Jack Smith, DEC's senior vice-president of engineering and manufacturing, admits that DEC is working furiously on fault-tolerant features for its VAXs, a characteristic that is becoming crucial to OLTP.

After those three come companies like Stratus Computer, Inc., Sperry Corp., Burroughs Corp., Amdahl Corp., Hewlett-Packard Co., AT&T, Microdata Corp. and Wang Laboratories, Inc. The market has had its fair share of start-up vendors as well in the last few years. Two — Synapse Computer Corp. and Auragen Computer Corp. — were rather spectacular failures. Others, such as Tolerant Systems Corp. and Parallel Computer Corp., have had varying degrees of success and are still working hard to gain market share.

Cost is another area of great confusion and often acrimonious debate. In the OLTP world, cost per transaction is the standard price/performance benchmark. Cost per transaction is arrived at by dividing the total system cost by the average number of transactions per second (TPS) the machine performs. For example, a system that costs $1 million and averages 40 TPS has a cost per transaction of $25,000.

The problem is that various vendors have made different cost per transaction analyses of their own as well as their competitors' equipment. Each claim usually results in a counterclaim from a competing vendor. Users should keep two things in mind. The first is that system prices have dropped to below $100,000 at the low end, making them an attractive alternative to some users who might have otherwise bought a more traditional minicomputer. Second is that users should run their own benchmark tests.

The many definitions for OLTP might account for the variety in market size estimates. But, Gant says, her definition is based on how and users actually use the systems, not on a set of technical criteria or features geared to applications. "There are characteristics that make a system more suited to on-line transaction processing," she adds, "but they are not requirements."

The extra characteristics that some say fit the true definition of OLTP are transaction tracking and fault tolerance. With transaction tracking capabilities, the data base tracks each transaction as it occurs and can, if necessary, roll back the transaction should it fail during a power blackout, for instance.

The second characteristic, fault tolerance, is appropriate for some OLTP applications, but not necessarily all. Through a variety of means — both hardware and software based — fault tolerance ensures that a system will keep running despite component or power failures. Users should not be confused about fault tolerance and its overall position in the marketplace.

Although closely identified with OLTP applications, fault tolerance is an optional feature of some systems, not a market requirement. In fact, Tandem, which is credited with creating the fault-tolerant technology, is currently pushing itself hard as a systems vendor with strong fault-tolerant features rather than as a fault-tolerant vendor.

The typical user: Savings Bank Trust

It is probably impossible to pinpoint a truly typical OLTP system user. Besides the application itself, too many other factors come into play. What percentage of the company's in-house processing is devoted to on-line as opposed to batch processing? What response time does the user consider appropriate for OLTP applications? How much disk space does each type of application use? What communications protocols does the company support?

If a typical organization were to be selected, the Savings Bank Trust Co., which is headquartered in Woodmere, N.Y., might be a prime candidate. The bank, with $1 billion in assets, is owned and operated by 97 savings and loan institutions throughout New York. In every conceivable way except one, it functions as a commercial bank, according to David Zang, the firm's vice-president, systems planning. The only exception is its customer base, which is limited solely to the 97 owner banks.

Like a commercial bank, the company is in the traditional mainstream of OLTP applications — banking and finance. Second, for a limited number of owner banks, it provides end-user computerized banking services, such as support for ATMs and on-line teller platform automation.

Third, it acts as a clearinghouse for checks written against the accounts of its member/owner banks. Fourth, and perhaps most typical of all its features, the Savings Bank Trust does its OLTP applications with IBM and DEC hardware, software and networking protocols.

Companies such as Tandem and its upstart challenger, Stratus of Hudson, Mass., may be dedicated to OLTP, garnering most of the attention, but the bulk of applications are actually performed on more traditional, non-fault-tolerant computer architectures supplied by the more traditional manufacturers — IBM, Burroughs, Sperry and possibly DEC, depending on whose statistics and definitions one follows.

At Savings Bank Trust, a DEC VAX acts as an intelligent front end to an IBM 4300 mainframe. According to Zang, users first perform applications on the VAX then pass the data to the IBM mainframe through a 3705 communications controller. User banks access the computers from a variety of terminal devices — including IBM Personal Computers — all of which emulate a DEC VT200-type terminal. Then they can gain access to IBM CICS and other transaction processing programs. IBM 3270 terminals are made to look like DEC VT200 terminals as well, Zang says.

According to Zang, the firm will move more of its on-line applications, such as ATM support and platform automation, toward the VAX. Eventually, he says, the IBM mainframe will be used almost exclusively for bulk batch applications. And although his systems are not innately fault tolerant, like those from

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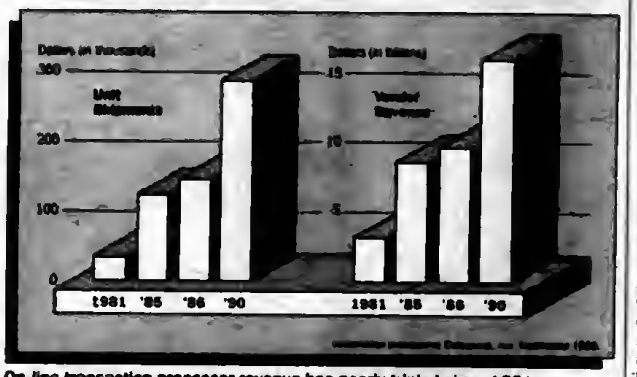
JEFF BARNEAU

U.S. ON-LINE TRANSACTION PROCESSOR REVENUE



On-line transaction processor revenue has nearly tripled since 1981.

Expert's Opinion

Specialized tools, availability spur growth of OLTP

By KIM BROWN

While the business computer system slump that began in 1985 has affected most of the big players, a few companies have managed to more than hold their own. Companies such as Tandem Computers, Inc. and Stratus Computer, Inc. have experienced excellent revenue and earnings growth over the past two years due to specialized product offerings designed to fulfill the needs of on-line transaction processing (OLTP) users.

OLTP is the process by which the state of a company's business is changed by updating, in real time, a computer data base that describes some part of the business or that allows a customer or employee to make a decision that may change the state of the business as a result of consulting or querying the company's data base.

These transactions have a distinct beginning and end and occur between an interactive terminal and a host processor, or processors, that manipulates the data base. (See chart of typical OLTP configuration page 45.)

> ***Because OLTP involves updating a shared data base that must be accurate at all times, data integrity is also a key need.***

To be considered for an OLTP application, a computer system must either have high availability or be fault tolerant. Dataquest, Inc. defines a high-availability system as one that can statistically be expected to be down for fewer than four hours per year.

End-user buying criteria must be considered when designing features into an OLTP system. The buyer of such a system is interested in many of the same benefits, such as cost and performance, that buyers of any computer system would be interested in; however, because the system is used in a real-time mode, availability becomes a key buying criterion.

Also, because OLTP involves updating a shared data base that must be accurate at all times, data integrity is also a key need.

Availability is broken down into several key elements including the following: reliability, vendor system support, on-line expandability,

Brown is an analyst with Dataquest, Inc.'s Business Computer Systems Industry Service in San Jose, Calif.

applications and product availability as well as a stable architecture in which applications do not have to be converted.

Although a myriad of system architectures have been devised to penetrate the OLTP market, most vendors have adopted one or a mixture of the following architectures:

• Monolithic mainframe. Most large OLTP systems use a host mainframe upon which the data base is kept. IBM's IMS, TPF2 and CICS data bases running on 3080 or 3090 series or plug-compatible mainframes account for more than half of the OLTP revenue dollar.

Burroughs Corp., Sperry Corp. and Honeywell, Inc. also have a large installed base of host processors used in OLTP applications. These applications are firmly entrenched due to the huge investment in applications software, networks and training.

Most of the other OLTP vendors have targeted companies' new applications or specific subsystems within an OLTP system, such as front- or back-end processors, with their offerings.

• Minicomputers with systems-level fault tolerance. Minicomputers are often the host processor for a smaller system. Last April, NCR Corp. announced fault tolerance as a feature of its 9800 system.

By mirroring applications across multiple minis and multiple disk drives, the aim of fault tolerance is achieved: If any system component goes down, the end-user application continues to run. The system uses a common bus with processors that can be programmed to back each other up and/or process separate application streams.

Changes have been made to NCR's VRX operating system to incorporate fault tolerance. Dataquest expects Digital Equipment Corp., Data General Corp. and Wang Laboratories, Inc. to have similar offerings via common bus or clustering techniques as soon as changes to their operating systems can be made.

• Hardware-only fault tolerance. Fault tolerance is most important at the front-end processor. If the eventual host goes down, data can still be collected and forwarded when the host is brought up.

Firms such as Stratus offer a hardware-only fault-tolerant product that doubles up the processors, controllers, buses and so on and utilizes a comparator, a circuit that compares data across the two systems to ensure integrity and to see that both sets of hardware arrive at the same answer.

IBM, which is an OEM for the Stratus product, has added extensive Systems Network Architecture capabilities so that it will integrate well with its host systems.

Tandem uses a combination of both systems-level fault tolerance and hardware-duplication fault tolerance, as Concurrent Computer Corp. does with its Resilient series and Computer Consoles, Inc. does with its Power 6/32 FT system. Honeywell's DPS 8 systems can be purchased in a multiprocessor mode with full redundancy capabilities.

• Unix-based systems. Many start-up companies, such as Arete Systems Corp. and Tolerant Systems, Inc., offer Unix-based systems.

By offering Unix, these companies can concentrate their research and development dollars on hardware and specific segments of the operating system, rather than on the entire operating system, data base, data communications and languages.

Unix-based systems are like a double-edged sword. The cost of entry is low, and more applications are available each year to run under Unix.

Unix is practically a nonproprietary system, so if the user decides to convert to it, he will not be tied to one vendor, but rather any Unix vendor.

In the long run, however, the Unix hardware market will become a commodity market with very thin margins. The real winners in the Unix world will realize better margins through excellent services and support. The quality of a vendor's applications development tools will be paramount to success.

• Back-end data base processors. Relational data base structures offer an excellent by-product when implemented for OLTP. Once the data base is built, decision-support capabilities are available to further enhance the company's business.

> ***"As the effective cost per transaction continues to shrink, the OLTP market will grow to more than 70% of new business computer system revenue."***

Queries of the data base can be made by managers who do not have programming expertise.

The drawback to relational data bases is that they are notoriously slow and demand great resources such as processor power and memory.

Britton Lee, Inc. and Teradata Corp. offer a back-end relational data base processor with specialized hardware and software that off-load the data base management systems from the host processor.

The result is an efficient relational DBMS with high transaction rates and the ability to process queries that do not demand programming expertise.

Dataquest expects IBM and possibly Amdahl Corp. to offer a back-end data base processor, perhaps within the year, designed to add great efficiency to IBM's DB2 relational data base. Also in the near future, DEC is expected to announce a back-end data base processor, which will then put pressure on IBM to announce its version.

Since 1981, when OLTP accounted for less than one-third of new sales, the market has grown in size and importance to more than $17 billion in worldwide revenue in 1985.

As the effective cost per transaction continues to shrink, this market will grow to more than 70% of new business computer system revenue (not necessarily unit placements), or $35 billion in 1990.

OLTP has become the most explosive segment of growth in business computer systems sales. Many factors have contributed to this growth, including the following:

• The cost per transaction has dropped dramatically in recent years. This decrease is the result of less expensive disk drives, telecommunications, memory and all other components. With a lower transaction cost, many more applications can be justified.

• Data base technology has evolved in recent years, offering better price/performance as well as more functionality. Data base processors will further enhance data base efficiency.

• More applications software has been written for this rapidly growing market. Software houses and value-added resellers have focused on applications because the demand has grown. These applications have increased worker productivity, further raising the utility of such applications.

• The service sector of the economy is growing much faster than the manufacturing sector, and OLTP lends itself to service businesses such as telemarketing, insurance and banking. Service companies see OLTP as a way to gain a competitive advantage.

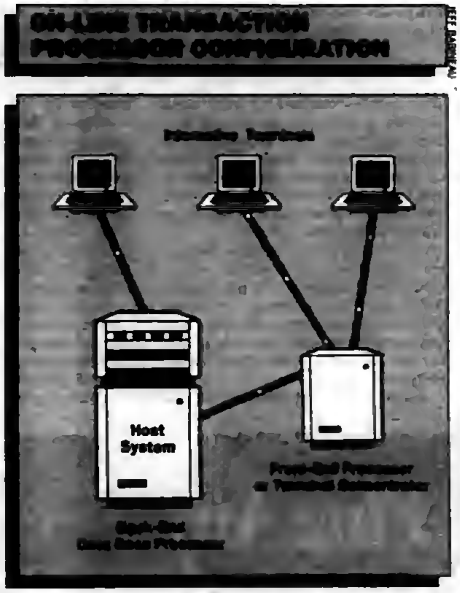
• When IBM decided to be an OEM for the Stratus system, it legitimized the fault-tolerant, front-end OLTP processor much as it legitimized the personal computer market in 1981.

• The new architectures developed in recent years offer users greater flexibility in implementing systems.

The market will continue to grow as more applications are developed and more batch applications are converted to real time.

Because on-line transaction processing offers hope in an otherwise dismal computer industry, more vendors will develop products to address the OLTP marketplace, competition will continue to bring prices down and even more applications will be cost-justified.

The snowball effect will build even higher demand for these products. This will result in higher total business computer system revenue and greater ease for consumers performing business transactions. ■



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Tandem, Zang plans to make the bank's on-line computer systems fault tolerant in a different way.

At this time, Savings Bank Trust has a second data center in upstate New York, near Utica, which ensures that operations can keep going in the event of a failure at one center.

However, the data centers may have duplicate functions, but they are not identical. The Utica data center has an IBM mainframe that is identical to the Woodmere facility's, but no DEC VAX front-end processor.

Zang says he will push to install a duplicate VAX in Utica next year. Then, he says, the bank will have two identical data centers, either of which will be able to completely back up the other should one fail. Zang calls this arrangement "the ideal service bureau solution."

Fault-tolerant computers may not be required for many applications, as Gant points out, but for Buckeye Pipeline Co. and others, it remains essential. Buckeye of Emmaus, Pa., is the oldest pipeline firm in the nation. It does not manufacture any pipes, it just builds pipeline systems and maintains them.

According to Bob Adams, Buckeye's director of information systems, the firm owns and maintains 3,600 miles of commercial pipelines throughout the Northeast. Its pipelines supply virtually all the jet fuel for the three airports serving metropolitan New York.

Keeping the fuel pumping safely through that labyrinth of pipeline is the main concern of Buckeye's system control and data acquisition system. The process control system constantly monitors the 3,600 miles of pipeline for leaks as well as security violations. Data is collected and sent back to the main OLTP host. The collected data is then run against a set of "ideal" data. If a difference is noted, it is reported and appropriate action is taken. The system monitors flow control and leak detection, opens and closes valves, starts and stops pumps and performs closed-loop controls.

It is this need for constant, on-line information 24 hours a day that made Buckeye Pipeline look to a fault-tolerant, OLTP-based process control system for a solution. Adams explains that the system, installed about five years ago, was designed by novice consultants and system programmers who had no idea that what they were undertaking — building a centralized process control system from scratch that did not run on IBM hardware and that was written in Cobol — was considered not only unwise but impossible by most seasoned veterans.

However, Adams contends that traditional process control systems, such as those from IBM, are much too complicated and require too much overhead. The simple approach of a fault-tolerant OLTP system made more sense, he says. It helped, he adds, that neither the consultants nor the programmers knew that they could not do it, so of course they went ahead and did it.

Adams says the firm is constantly adding more functions to the Tandem systems that form the basis of the process control network. The system is already providing automated ticketing services for customers, which independently read meters to determine start and stop readings. The difference is then billed to the customer. In addition, he says the firm is looking at adding satellite transmission capabilities in the near future.

A new frontier: The paperless factory

Do not be fooled by the name. Hughes Aircraft Co., founded by the billionaire recluse Howard Hughes, and now a subsidiary of General Motors Corp., does not manufacture aircraft at all. It is a diversified electronics design and manufacturing concern with businesses in medical and defense research and manufacturing. The only things it makes that fly are advanced missiles and weapons systems for the U.S. military.

At its Tucson, Ariz.-based Manufacturing Division, the $2 billion applied electronics firm has also been part of a new breed of OLTP system users — those using their OLTP system for a manufacturing application (see story page 52).

Office automation's promise of the paperless office was a pipe dream, but the paperless factory is turning out to be real. Hughes' hybrid manufacturing line is a pioneering example of the paperless factory and computer-integrated manufacturing (CIM), and it is using a network of fault-tolerant, OLTP systems to do it. For about a year now, the division's hybrid electronics manufacturing line has been up and fully automated, according to Peter Radtke, the division's manager of microelectronics and factory automation.

The goal is to reduce paperwork and speed up changes on the production line. To do this, the Tandem systems are tied into IBM mainframes, DEC VAXs and Computervision Corp. computer-aided design and manufacturing (CAD/CAM) systems in other nonmanufacturing departments.

The Hughes OLTP system also constantly monitors the shop floor and returns all data to the host computer, where it is run against a set of pre-established production and quality assurance criteria.

Constant access to the data base is OLTP's forte. But in factory automation, OLTP takes on an added

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Interview

OLTP — At the heart of the business

Omri Serlin, president of Itom International Co., a research and consulting firm in Los Altos, Calif., closely follows the growth and expansion of the on-line transaction processing (OLTP) market. He recently spoke with Computerworld Senior Editor Glenn Rifkin about the state of OLTP.

How do you define OLTP?

Certainly one of the big problems in getting a handle on the size of the market is that there is no universally accepted definition. I have identified a number of key elements that are characteristic of OLTP systems. One, the systems are typically large. Two, the systems typically have a large common data base, and that data base is accessible to a large number of interactive users who are permitted not only to query the data base but also to make updates of data in the data base. Three, the applications are in the mainstream of the business they serve as opposed to simply keeping track for bookkeeping purposes.

OLTP systems sometimes *are* the business — for example, in information utilities. More often than not, they are the major tool the business uses to offer either a service to external customers or a facility for internal employees to facilitate day-to-day operation of the business.

What are the key issues facing the potential user of OLTP?

The user faces all the typical issues associated with establishing a new computer-based application, with the additional set of concerns that once you've switched to this mode of operation — processing transactions on-line — typically there is no backup.

There is a very high concern for high availability because the system is typically right at the heart of the business it serves. OLTP has been the most notable consumer of fault-tolerant systems.

What effect will OLTP have on MIS?

Traditionally, OLTP systems use large computers, usually IBM mainframes, and they typically have been under the control of the central DP organization. That's changing.

One of the most active areas in OLTP is in manufacturing, where concepts like the paperless factory or just-in-time inventory disciplines are becoming very popular. In many cases, those are being implemented on a plant-by-plant basis with local control and not necessarily any involvement from central MIS. So as time goes by, you are going to see smaller OLTP systems under control further away from the corporate headquarters.

Will MIS try to maintain control anyway, as it has with other distributed systems?

It's clear that eventually some kind of corporatewide coordination is of great value to the business. So naturally if the system is implemented in a way that no data can be interchanged with the central corporate computers, you've got a problem.

How critical is fault tolerance to OLTP?

Again, that's another area where definition makes a great deal of difference, and there is no accepted definition. My view is that a minimal requirement is that it's a system that must be able to protect the data base's consistency and integrity. And it must do so with automatic facilities in which user involvement is minimal and user awareness of faults in the system is minimized.

Should potential users consider a full OLTP system, or could they just add a front-end fault-tolerant system to their mainframe?

Itom International's Serlin

A minimal requirement for an OLTP system is that it must be able to protect the data base's consistency and integrity.

Various approaches are being tried. Certainly part of the fascination with distributed processing and with front ending has been that, on the one hand, it gives you more complete control over that particular aspect of the operation.

On the other hand, it doesn't bother the users of the existing central facilities, which MIS has under its control.

But again, the trend is toward integration, so those vendors that have both the high-powered machines and an operating system and a software system that are oriented to OLTP obviously are going to have an advantage.

What challenges does IBM face?

IBM is the favored vendor because of the wide distribution of its machines and software throughout the user community. It basically has to deal with price/performance issues, and perhaps with the fact that it does not offer as easy an upgrade path as some of the upstarts like Tandem Computers, Inc.

The Tandem story is very attractive because it allows users to start off with just a few processors and then plug additional processors right into the cabinet as the processing requirements grow.

Will a company like Digital Equipment Corp. be able to capitalize in this area?

There have been consistent rumors that DEC is eyeing that marketplace. I've seen a number of indications over the past year or so suggesting that they have done some serious work in this area. Their penetration to date has been minimal. A small percentage of the VAXs installed are actually in OLTP applications. And part of the reason is that they really do not have a complete software offering in that area. Their major vehicle in that area, the Application Control and Management System package, apparently leaves a great deal to be desired. Their ability to expand is also limited by the same problem facing IBM — their current solution being the Vaxcluster.

Unfortunately, the Vaxcluster does not support enough of the transaction processing environment and especially the data base consistency and integrity feature across the cluster. These features are being implemented on a piecemeal basis in the VMS operating system. My impression is we still have a few years to go before we see the full offering in this area.

What about AT&T?

AT&T could very well be a dark horse. They have a machine under development called Apache that is a multiprocessor system. There is already a committed customer that would like to make it the linchpin of its offering. The customer is Atex Corp., a subsidiary of Eastman Kodak Co. They've already selected a Philadelphia newspaper as the beta site. All of this is going to happen in October or November. I would not count AT&T out, although Unix is not a hospitable environment for OLTP.

What will be the impact of Unix?

The Unix basic file structure is so elementary and so lacking in anything that would be a considered basic requirement of an on-line or data base-type environment that it's hard to imagine why anybody would consider Unix as a base.

And, in fact, all of the people today who have OLTP systems that claim to be Unix compatible, without exception, have in effect implemented two systems. The first is a data base system that has the full various access methods, indexing capabilities and transaction recovery capability. And then, second, an interface that allows users who so choose to also run Unix programs.

Without exception, that's the approach anybody has taken who claims to have Unix in the transaction processing environment.

I know of no one who has actually gone into Unix for OLTP. They might say that, but the end result is that you have Unix, which is one thing, and you have a transaction system, which is another, and they happen to run in the same machine.

What about other vendors like NCR Corp.?

NCR is making a major push in this area with the 9800, which they unveiled back in April. This is a multiprocessor system that will have, by early next year, all of the data base consistency, integrity and transaction support software available. The system does have the graceful growth characteristic and does support a good degree of fault tolerance.

There are two problems, though. The first is the basic processor they are using is not very powerful, and for that reason I find it hard to believe that they will be able to show very good performance relative to other systems in the field. The other problem is how to get non-NCR customers interested.

Do you see any partnerships forming?

There have been rumors flying around, and Wall Street would love to see something like that because every time there is a merger, a lot of people make a lot of money. But I don't see any functional reason for this to happen.

Tandem has got a product line that pretty much covers the range of performance, capability and prices they are interested in. So they are basically a stand-alone computer company.

Stratus Computer, Inc., probably by the middle of next year, will be in roughly the same position. Those two are probably not candidates. So what's left over are the struggling little companies that are candidates for acquisition rather than merger.

What are the future growth markets for OLTP?

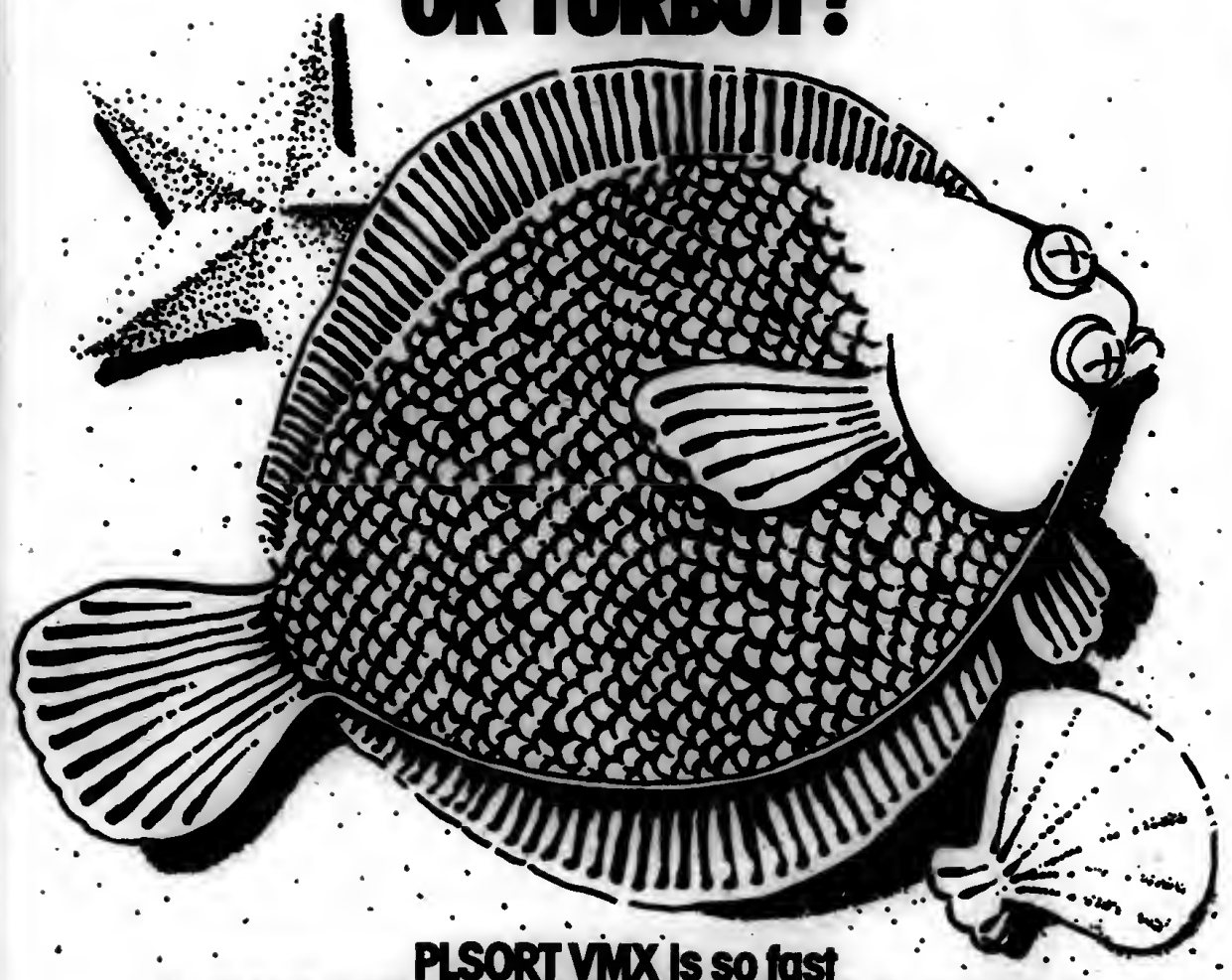
Airline reservations is pretty much a closed market, although some smaller airlines are implementing smaller systems.

To some extent, the banking systems arena is closed, too, because the top 100 banks in the world have pretty much committed themselves to their particular DP solutions, and the smaller banks are not as interested in building their own systems as much as they are interested in joining networks.

The two areas that are the target of Tandem and Stratus, and others as well, appear to be in the manufacturing area and in value-added networking, such as things like Federal Express Corp.'s Zapmail, which, in fact, is a nationwide value-added comunications system basically used for facsimile transmissions based on Tandem computers. ■

TURBO

OR TURBOT?



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dimension. Therefore, should an error be detected or manufacturing specifications be altered, the Tandem systems can downline load manufacturing and planning instructions to the various pieces of equipment on the shop floor.

Radtke says that the main attraction to OLTP systems for him was fault tolerance; the line must keep going to meet production schedules. Today, the line produces 6,000 large military hybrids a month. Hybrids are sophisticated military electronics that go into missiles and other airborne defense systems. Other manufacturing lines at the Tucson facility are also looking into automation with OLTP systems, the manager says.

More than ever, these systems are taking on vital functions in the large corporation, particularly customer service and support in banking and retail point-of-sale (POS) applications. More important, new systems can and do provide some companies with competitive advantages.

Backed by an MIS department independent of the mainstream corporate MIS establishment, Mobil Oil Corp.'s U.S. Refining and Marketing Division has for the last five years spent a considerable amount of time, energy and money bringing up a nationwide POS network.

> ***Information in OTLP systems is not only vital to the corporation itself, it is the corporation's business.***

According to Johnathan Briggs, Mobil's POS project manager, the Fairfax, Va.-based division uses a number of Tandem Non-Stop OLTP systems to drive its network of POS systems at 3,600 service stations nationwide. All 3,600 cashier terminals communicate through leased lines to the main data processing center in Kansas City, Mo., which uses an IBM mainframe.

The Tandem POS network does what Briggs calls a negative file lookup, meaning it runs a credit check against bad customer accounts before issuing credit card authorizations. In addition, the POS network also gathers customer billing data on Mobil's own credit card users.

The Tandem network performs the on-line processing tasks, then at night off-loads the information to an IBM mainframe running proprietary Mobil applications, according to Briggs. OLTP systems can play an important strategic role in keeping a company ahead of its competition.

At Mobil, the credit authorization is the key to keeping that edge. Briggs says Mobil is planning for the cashless society that the advent of debit cards and regional banking cards might bring. Mobil is considering adding these capabilities sometime next year.

Already, the firm is devoting part of the Tandem's processing capabilities to communications switching between Mobil's own credit card authorization and those for other major credit cards. The needed credit information is collected by the system at the service station, enters the network and is passed through to the appropriate third-party credit card authorization facilities.

The next step will be for Mobil to switch a debit transaction request through its own system to a corresponding OLTP system at the local bank.

Once there, the transaction request would check the current cash balance of the customer's account and either approve or deny the transaction. If approved, the appropriate amount would be automatically deducted from that account and passed onto Mobil accounts. With an on-line foundation already in place, that should not be difficult.

Increasingly, the information stored in OLTP systems is not only vital to the corporation itself, it is the corporation's business. At Michigan Bell, part of the $2 billion Ameritech regional Bell holding company, 95% of all processing of the Southfield, Mich., telephone company's processing is devoted to on-line applications, according to Earl Ross, the firm's general manager for MIS.

Ross does not think this is odd, especially in larger service-oriented firms such as phone companies. Everything from customer accounts to service and repair records are kept on-line; much of the business depends on that and can be done no other way. The only time sizable batch applications are performed is at night, after business hours, Ross adds.

But it is unusual, at least for now. Most other users say that between 40% and 60% of their overall processing capabilities are devoted to on-line applications. Whether or not the on-line nature of data processing at Michigan Bell is a precursor of the future of OLTP in the large corporation or a freak occurrence, neither vendor nor analyst would say for sure. It seems apparent, however, that more applications will go on-line, especially as system prices and the cost per transaction continue to fall.

Interestingly, Michigan Bell's Ross indicates that his firm has a broad definition of what constitutes on-line, in that response time is not as important as having the data on-line in the first place.

With so much of its business and customer goodwill relying on easy

Continued on page 53

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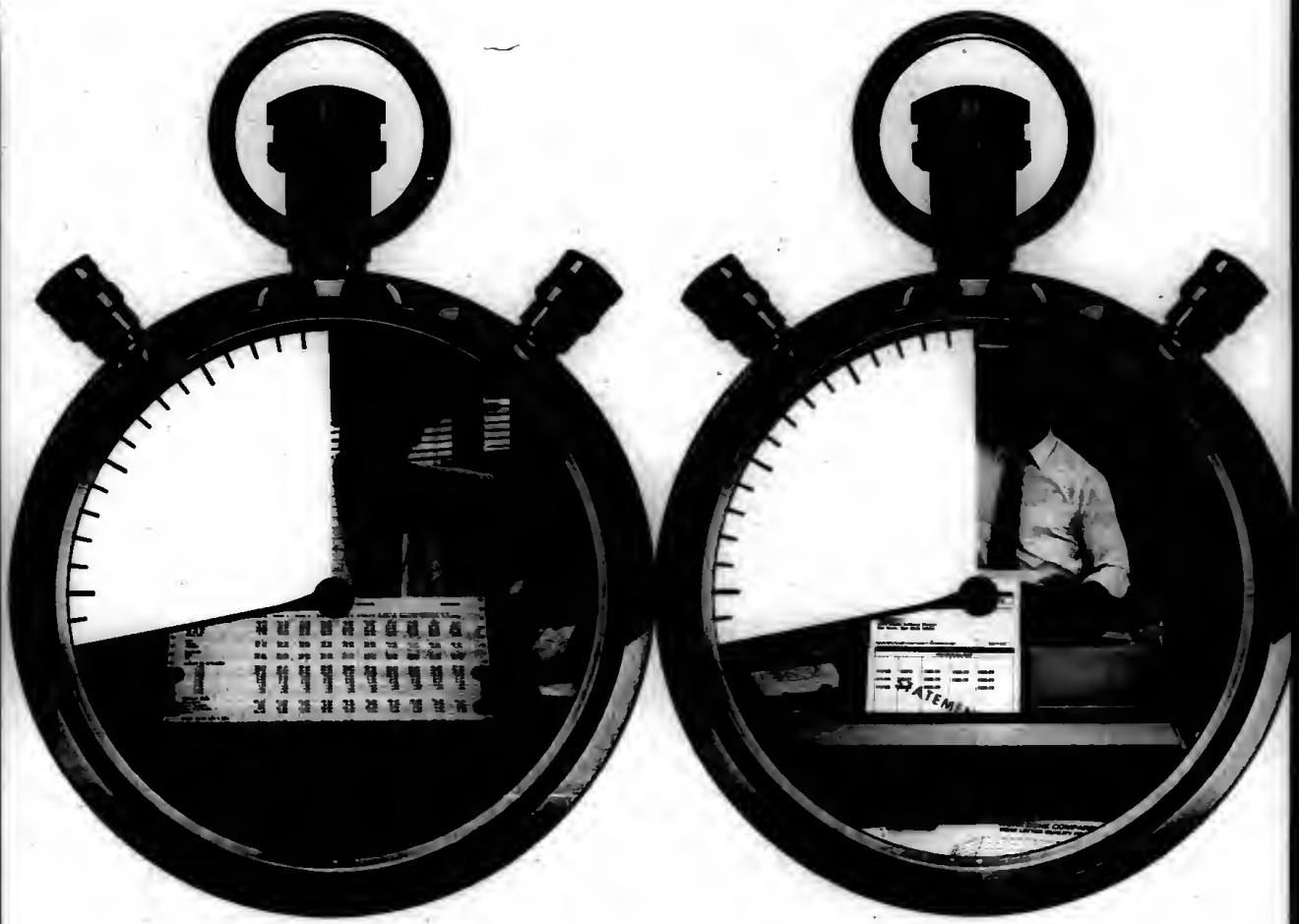

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Integrating islands of information

By GLENN RIFKIN

The factory floor is a sea of transactions, says John Morgridge, senior vice-president of marketing for Stratus Computers, Inc. That description, borrowed from a colleague, clearly reflects the direction of on-line transaction processing (OLTP).

As commercial OLTP applications markets such as finance, airline reservation systems and point-of-sale systems become saturated, vendors are turning toward manufacturing as an outlet for their products. They are finding a nascent market in manufacturing companies for OLTP-type applications.

According to F. J. Grant, an independent manufacturing consultant in Marietta, Ga., recent attempts to automate the factory have resulted in islands of automation. These islands must not only be tied together in some effective manner, but must include real-time links to the front office.

"To make money, factories must control costs. To do that, they need more and better information," Grant says. "Therefore, everyone wants on-line information. People want data faster; they want to be able to massage it, and they don't have time to study data for months. They need it immediately."

"You simply can't get management information fast enough for decision making," adds Jerry Dusa, director of marketing at Tandem Computers, Inc. "Batching data once a day is not enough."

OLTP reduces labor-intensive data capture and eliminates much paperwork, Dusa says. "By having machines drive machines rather than people, you reduce labor expenses," he notes.

For OLTP to be effective in the factory, however, much must be done. An integrated communications network and the ability to collect data on-line are fundamental to OLTP. In addition, there must be consistency across and among the various data bases that affect the operation from front office to shop floor. Although such protocols as Manufacturing Automation Protocol (MAP) are gaining converts, there is a long way to go before refinements in the standards show their effect. Until standards emerge, the factory floor will not be a single-vendor shop.

In addition, the need for fault tolerance embedded in OLTP systems is becoming more apparent. According to Marcia Brooks, a consultant with International Data Corp. (IDC), "Fault tolerance adds the extra measure of reliability beyond real-time operation that makes it more than just a nice feature. In many cases, it has become a requirement."

Tandem, which holds upward of 80% of the fault-tolerant market in manufacturing systems, already receives 20% of its revenue from the manufacturing arena and expects that percentage to grow steadily.

"Customers need equipment that provides high availability as well as equipment they can use to integrate all these separate islands together," Dusa says. "It's to the point where if you can't offer this, you can't bid on a request for proposal."

Dusa says he belives the split-second decision making needed in many aspects of factory automation dictates the need for fault tolerance. "Fault tolerance is more and more a critical attribute of OLTP machines. In many cases, you simply can't afford even a one-second hiccup," he declares.

Stratus, expecting to find a vast opportunity in this area, became the first fault-tolerant vendor to embrace MAP. According to Morgridge, the company says it believes strongly that OLTP in manufacturing is the growth area for its machines.

"Within the last five years, there has been a philosophical change in how one runs a factory floor," Morgridge claims. "The big push in the 1960s and '70s, starting with the advent of Material Requirement Planning [MRP], was to collect data so that we knew what was going on down there after the fact. Now, modern manufacturing philosophy embraces just-in-time techniques and tries to be responsive within the moment. That dictates a much higher level of automation in the factory, both in terms of collecting the data and controlling the process."

Customers expect higher quality products year after year and manufacturers must initiate the changes to keep them competitive. MRP, Grant says, has not allowed for the flexibility needed to make those changes. "MRP was installed with the idea that you would make only one or two products," he explains. "OLTP systems should be general enough to collect the data and then allow fourth-generation languages to create specific ways to report the data."

Manufacturing experts agree that OLTP will be a major force in the factory. "OLTP systems will ultimately affect the very way we are organized as manufacturers," Grant says. "OLTP systems potentially can give us a competitive advantage in global markets."

Unfortunately, that enticing future seems at present to remain out of reach. Though automated systems pervade Fortune 500-level manufacturing organizations, the systems are

Riftkin is a Computerworld *senior editor.*

Stratus's John P. Morgridge

from diverse vendors — Digital Equipment Corp., IBM and Hewlett-Packard Co. for information systems and Allen-Bradley Co. for process controllers, to name a few — and the hope of tying them together remains a vision of the future.

"One of our biggest concerns is how to integrate different systems together in a productive fashion," says Bill Veeneman, design specialist in management systems for Proctor & Gamble Co. "That is why MAP will be very important. But the hard part is integrating applications together. That's not easy to do on the same computer from the same vendor; it's really tough on different computers from the same vendor, and it's impossible on computers from different vendors."

As Veeneman points out, on-line processing at Proctor & Gamble now means real-time processing within factory floor applications. The data is still batched up to the corporate system at a later time. "We've got to get there, and we intend to do more OLTP. There is a lot of talk, but it's not really happening yet," Veeneman says.

Linear expandibility is crucial, Dusa agrees. "If you can't grow your system with the same application software, the decision to automate can be very painful," he declares.

In fact, many argue that the technology to create successful OLTP environments in the factory is already available. The bigger obstacle is the lack of clear planning and implementation.

"Most companies haven't formed a long-term policy for computer integrated manufacturing," IDC's Brooks says. "But you've got to know what your plan is before you know what tools you need."

Grant recalls a recent conversation with a Hitachi Ltd. official in Japan. "I asked him what the major difference was between Japanese and American manufacturing cultures," Grant says. "His criticism was stinging. He said that in Japan they spend 90% of the time thinking about manufacturing processes and 10% doing it. In the U.S., it is just the opposite.

"We are just not spending enough time planning and thinking about building the infrastructure in manufacturing. The piecemeal approach to building factories is not the way to go. If manufacturers had more of a crystallized view of what they wanted, manufacturing systems, such as OLTP, would be more forthcoming."

Nonetheless, Grant says he believes strongly that OLTP is the wave of the future in manufacturing. "As we move into the 21st century, nonstop on-line transaction processing will be the standard in supporting shop floor activities." ■

Continued from page 49

access to large amounts of on-line data, one might think the firm used many fault-tolerant computers. But just the opposite is true. Ross says he would like virtually all his applications on fault-tolerant machines. "As a data director, I'd have to say that my life would be an awful lot easier if they were all fault tolerant."

But a serious roadblock stands in Ross' way. Too many of the applications have been written for other machines. His firm has IBM and Burroughs mainframes as well 40 minicomputer-class processors from DEC, Prime Computer, Inc. and others, including a fault-tolerant Tandem or two. That is not to mention all the personal computers.

And those applications would be just too expensive to port over or rewrite into a fault-tolerant computing environment. That goes for future applications as well. Ross says he will not go for a fault-tolerant solution just because it is fault tolerant, as much as he may like to. Often, the new application will have to work closely with an older one, and that older one could be on a Burroughs or IBM. That would make one of those machines the logical choice for the new application as well.

Despite the hegemony of IBM in OLTP, most users have highly mixed hardware environments. No one vendor dominates the front line or front-end processing, though typically IBM has dominated the back end and batch processing and update functions. In other words, IBM, although it is winning the current battle for overall market share, appears to be becoming increasingly isolated from the front lines of many OLTP applications where the transactions are taking place. That leaves IBM mainframes as the data base custodians, the keepers of the data base.

Not only is the hardware mixed among different vendors' brands, but in general there exists a strong mix between fault-tolerant and non-fault-tolerant equipment as well. For instance, the Tandem, Tolerant and Stratus users contacted for this article all had other equipment, usually IBM, involved in their respective OLTP applications. Additionally, in all but one company, IBM ruled the general data processing shop as well.

One user, however, was not too enamored of the fault-tolerant computer vendors. Savings Bank

Continued on next page

Continued from previous page

Trust's Zang says his firm has a Tandem that it does not use because finding and keeping programmers who know Tandem's proprietary programming language is too difficult. Tandem does, however, offer other mainstream programming languages such as Cobol and C.

Fault tolerance can be achieved in other ways, not just through software features and redundant or duplicate hardware. Savings Trust Bank, with two data centers, illustrates another approach that skirts the fault-tolerant hardware issue while still delivering the protection of fault tolerance.

However, this is not meant to demean the importance of fault-tolerant machines in the overall OLTP marketplace. Like Michigan Bell's Ross, several users said they would prefer fault-tolerant computers for almost all of their applications, not just those that are on-line today. They say they plan to increase the use of fault-tolerant systems in both current and new applications.

In corporations in which the main business does not rely on OLTP systems to deliver services to customers, the MIS department's involvement with OLTP systems is generally limited to the system specification and procurement phase.

In these companies, once the systems have been installed, day-to-day operations or system maintenance falls on the shoulders of the corporate user community. For example, the marketing division at Mobil is responsible for issuing credit authorizations and gathering billing information through its POS network, but not for the accounting systems that issue the monthly bills.

Hughes Aircraft works the same way. Radtke says the decision to buy the Tandems was a joint one, made by both MIS and plant operations. Today, however, operations is in charge of running the system.

Regardless of MIS's role, OLTP systems seem to be outsiders in the overall corporate computing hierarchy. Despite the increasing demand for on-line information within user departments, OLTP for the most part exists as a completely separate application from other computing in an organization, including general-purpose data processing and office automation.

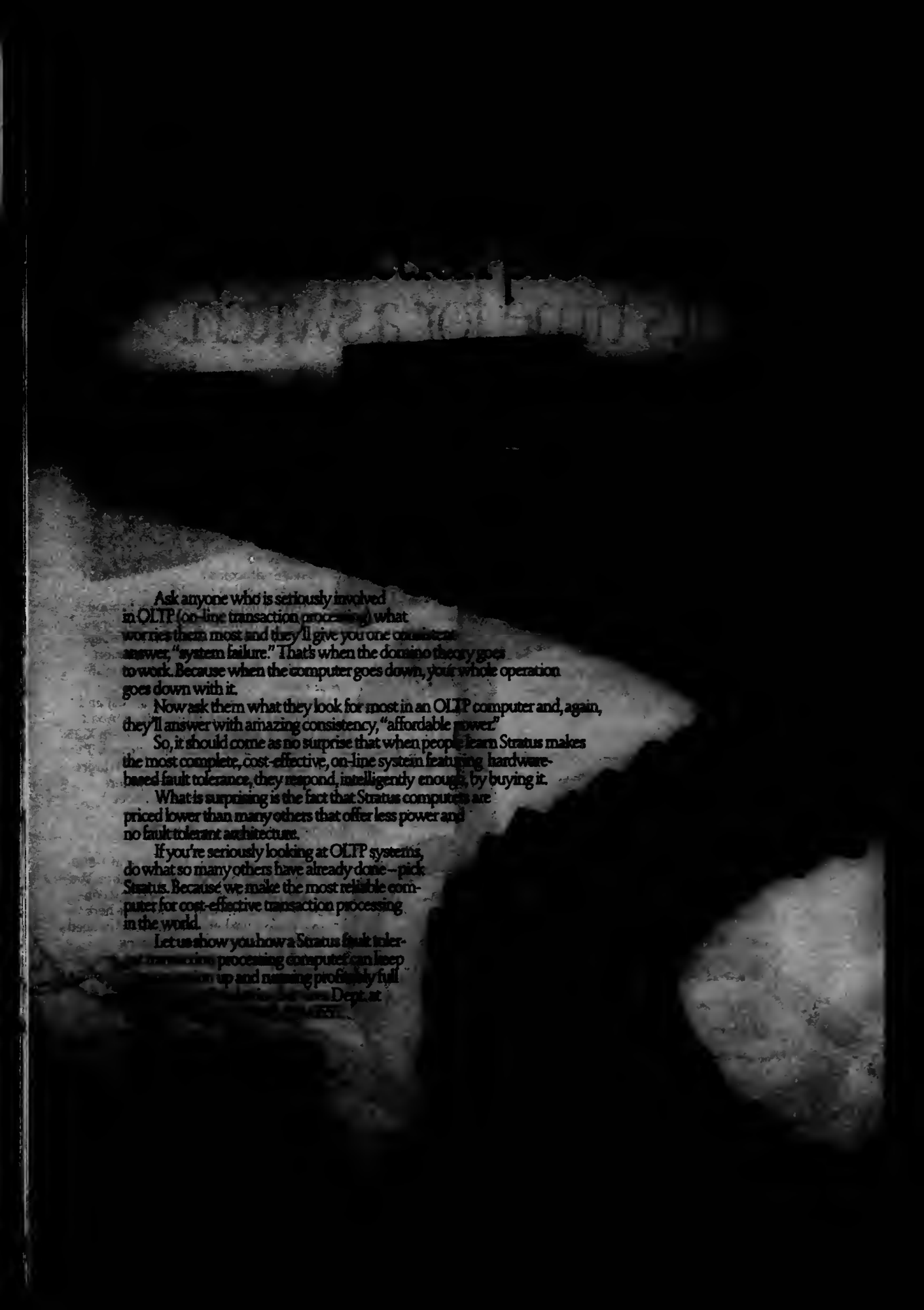
OLTP system users rate their systems highly and, in general, are extremely satisfied with their operations. The common wish list is short but to the point and not unexpected. Almost all wish for better communications links and integration of computers from different manufacturers. To this end, both the service and manufacturing concerns express support for the emerging International Standards Organization's Open Systems Interconnect (OSI) reference model, including Manufacturing Automation Protocol (MAP) and Technical Office Protocol.

> ***Several users said they would prefer fault-tolerant computers for almost all of their applications.***

OLTP vendors are in fact lining up behind the OSI standard, especially MAP for those competing in factory automation applications. IBM, DEC, Tandem and Stratus, to name a few, have disclosed intentions and/or products to address this need.

Besides better communications, a few of the fault-tolerant OLTP system users say they would like better facilities for bringing up enhanced operating systems and applications on one processor at a time, leaving the other processors in the system in production on the older versions of software. Many vendors claim this capability, but some users say it is not available to the degree they would like.

Finally, one or two users want better application development tools that would shorten the program development time and bring about improved programmer productivity. On these points, OLTP users and their batch processing counterparts do not seem very different at all. ■



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In Depth

What MIS professionals need from their 4GLs

Programming pros demand clean integration, quality output • Compilable source code means better performance control • Trade-off: power or short learning curve?

By W. W. D. DOWDELL

Software professionals who make a living from designing and writing computer software require different tools than end users who develop software for their own, or for very limited, use.

These nonprofessional users, for example, typically look for tools that require a very short learning curve — tools that allow for the definition of ad hoc reports and queries, spreadsheets and even modest data base inquiries and updates without the extensive training necessary to use programming languages such as PL/I, Cobol, Ada or C. The nonprofessional does not have the time or need to become a computer expert but is primarily interested in achieving a desired result as quickly and easily as possible.

This distinction certainly applies to fourth-generation languages. However, the needs of the nonprofessional users of software tools define computer solutions for limited audiences. End users do not have to be concerned with professional levels of software design, integration or performance. Simple, predominantly nonprocedural fourth-generation languages seem to fit the nonprofessional's data processing requirements very well.

Parallel needs

The additional burdens professional software developers impose upon fourth-generation languages become clearer when these tools are applied to the development of commercially packaged software systems or production systems in large companies.

ILLUSTRATION BY JON MCINTOSH

Because packaged software not only must provide the functional richness demanded by the marketplace but must also meet rather rigorous standards of reliability, performance, ease of use and maintainability, its development provides a particularly appropriate test bed for the DP professional's use of fourth-generation tools. Professionals in both situations share parallel needs in terms of the fourth-generation language they would choose.

As developers for a software vendor, Software International Corp., we discovered when we set out to build a family of business management applications that the requirements for tools to be used by the DP professional are considerably more complex than those for the nonprofessional.

We also found no commercially available fourth-generation language that fully met the needs of our professional development teams, whereas conventional third-generation language programming techniques could not achieve the productivity levels necessary to economically meet our development schedules.

Creating a suitable environment

That combination of circumstances forced us to create our own fourth-generation software development environment — an environment that enabled Software International to rewrite its entire mainframe product line in little more than one calendar year.

In creating this fourth-generation software development environment, the following points had to be addressed:

Integration. Because commercial application systems are usually large, they are often broken up into functional sections, with teams of developers working on each section. The fourth-generation language should, therefore, make it easy to coordinate the efforts of many developers into an integrated system.

Developer productivity. Because professional software developers tend to be an expensive commodity, the fourth-generation language should leverage their experience and skills to achieve high levels of productivity. This requires an array of specialized tools rather than a one-size-fits-all language.

Commercial-quality output. Because commercial software must meet high standards of functionality, reliability, performance, ease of use and maintainability to be competitive, the fourth-generation language should assist the developer in delivering systems with those characteristics.

Integration can be a two-edged sword. Although the benefits of software

About the author
Dowdell is manager of development systems for Software International Corp. in Andover, Mass.

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integration can be great, the enhancement and maintenance penalties paid for poorly integrated systems can far outweigh any benefits. Without a well-designed architecture, a highly integrated system can be likened to a house of cards — move one card, and the whole house falls down.

When we set out to build our applications family, Masterpiece, we knew that we had to start from the ground up. We did not want to make our new product just look integrated by writing a layer of connecting software around what were actually separate and distinct software systems. We sincerely believed that approach would lead to a maintenance nightmare of the first order.

Therefore, our first step was to define the application's architecture. "Intelligent architecture" is Software International's name for the way Masterpiece is put together. It represents the modular design standards and interprogram communication protocols that make the component applications work smoothly together.

> ***No commercially available fourth-generation language fully met the needs of our professional development teams, whereas conventional third-generation language programming techniques could not achieve the productivity levels necessary to economically meet our development schedules.***

One of the few things that is certain about software is that it *will* be changed. The intelligent architecture was designed to provide integrated systems that readily accommodate this change.

For the last 10 or 15 years, structured design and programming techniques have been accepted as a means of promoting software quality. The design principles of functional decomposition and modularity have proven to produce reliable and maintainable software systems. In our case, the development environment must ensure that the software developed by eight separate development teams operating on different schedules would work when brought together.

There are several advantages to such a modular approach. In the applications area, enhancements to functionality may be made quickly and surely because the affected functional modules and dependencies are easily identified. For example, if a tax law changes, only one module is likely to need modification, and simple regression testing can be used to validate the change.

Changes to application data bases or even a change of data base management system can be readily accommodated, since application modules look only at the logical data they need and are not concerned with physical data storage. Only those modules that work with the altered data elements need to be modified, and only the data access services need to be modified for a new DBMS.

Improvements to the user interface or changes in CRT technology require only changes to the terminal services and not to the logic of individual application modules.

Integration

When different developers and development teams must work on system components that will eventually be integrated, there is an implied need for all involved to have detailed knowledge of exactly how other developers are building their components.

The right fourth-generation language can play a major role in both minimizing the need for coordination and ensuring that the necessary level of coordination takes place. It can enforce a consistent procedure for building modules. Additionally, it can actively manage the interfaces between modules — that is, it can provide the interprogram communications protocols.

To provide a consistent procedure for building modules, we defined our own program definition language (PDL) and a syntax-driven editor for using it. We also created a library of module templates in the PDL that allowed us to use the skills of our best systems architects to create optimum module designs for the most commonly used module types.

When a developer creates a new program module, the editor prompts him for the information necessary to select the most appropriate module template and then prompts him for information specific to that template type.

The new module, containing the appropriate logic structure and I/O, is added to the developer's library. The developer is then free to use the editor and add logic to the new module as needed.

The PDL permits the developer to create only structured logic, and the editor provides a shorthand syntax for inserting additional PDL statements into a module. If a new module contains enough changes to represent a new template type, it may be reprocessed and added to the module template library after its structure has been tested.

Another example of imposed consistency is found in the screen-format generator that supplements the PDL and editor. The screen generator

is an interactive mechanism for painting on-line screens and menus. Again, the tool consistently asks the same types of questions about the format and data element content of screens and enforces the screen layout and processing standards defined for Masterpiece.

In order to coordinate an individual module's interfaces with the rest of Masterpiece, the PDL provides a command syntax for all terminal and logical data base access as well as interprogram communications commands.

This command syntax, coupled with a set of standard data communications blocks, ensures that the developer always follows the interprogram communications protocols defined by the intelligent architecture.

It also ensures that the developer of any one component will not have to guess where the "hooks" are for interfacing with any other component. He always knows what data to retrieve to perform the component's function and what data to store so other components may perform their functions without the developer's intervention or even knowledge of them.

Data dictionary

Although the above techniques certainly reduce the interdependence of individual software modules, some changes to data elements are inevitably going to affect more than one module. This is where another tool, the data dictionary, comes into play.

The dictionary is the repository of the information about application data — data formats, validation rules and so on — and, most important, where data is used and cross-referenced by data element, logical and physical record, program, screen, report and application.

The data dictionary allows the developer to identify all the components of the system that might be affected by a change to a data definition. Without the dictionary, developers could never be sure of the effects of a change or the integrity of the data bases.

To support the development of modern, integrated software systems, a fourth-generation language not only must encourage adherence to the rules of structured design and development but must also enforce those rules. It must be able to identify software interdependencies where they exist.

Putting in place the tools necessary to ensure the effective integration of software developed by different teams at different times took care of one of our biggest worries in building Masterpiece. The next challenge we had to face was developer productivity.

It is important to note that we were interested in developer as well as programmer productivity. Programming represents only 10% to 15% of the time spent in software development. If we were to achieve the productivity gains necessary to meet our extremely aggressive delivery schedules, we needed to improve productivity in other areas of the development cycle as well.

Fortunately, the tools we built to address the issue of software integration also paid off in terms of productivity benefits. In addition to reducing coding time by at least a factor of four, the use of module templates greatly reduced the overall time spent on program design and apparently reduced the time spent correcting errors detected during unit testing.

The PDL reduced the lines of code with which the programmers had to deal and, by enforcing structured coding techniques, reduced both the number of errors detected during unit and system testing and the time it took to correct them. The PDL also provided a very effective medium for conducting code walk-throughs, because it is much easier to read than many conventional third-generation languages such as Cobol and PL/I.

Another tool of specific benefit to professional developers is a prototyping system. Our in-house fourth-generation language uses a prototyping system driven by the images printed on the screen generator and by control records that allow the developer to define the structure of on-line applications. It allows developers to demonstrate the screen states and control flow that the end user would see without requiring that the actual application programs be written.

This gives the developer

and the application specialist an opportunity to review and agree upon the way the system will work prior to incurring the expense of writing programs. Because of the realistic nature of the prototype, there is very little reason for misunderstanding between the developer and the application specialist.

Developer productivity is probably the greatest strength of the commercially available fourth-generation languages, as long as the requirements for application functionality and integration remain relatively straightforward. When those requirements exceed the provisions of the language, developer productivity falls off.

Our third objective addressed an area where the commercially available fourth-generation languages failed to meet our requirements. In the delivery of commercial-quality software, the talents of the professional developer must be brought to bear, and that is precisely where the characteristics of the commercially available fourth-generation languages tend to trade off power and flexibility for a short learning curve.

> ***Fourth-generation languages that are predominantly procedural in nature give professional developers more control over software performance and allow them more freedom to use their knowledge of computers and design techniques to define efficient solutions to processing requirements.***

Because no fourth-generation language can do everything, the professional developer must be relatively free to extend the bounds of any fourth-generation language to achieve the requisite levels of commercial application functionality and ease of use. This means he should be allowed, when the fourth-generation language runs out of functionality, to revert to a third-generation language without incurring a prohibitive interfacing burden.

Some fourth-generation languages do allow exits to third-generation language programs. However, that solution requires the translation of one data definition syntax to another and the creation of additional program modules outside the source control of the fourth-generation language — both of which decrease the reliability and maintainability of the resulting system.

While software performance is of only minor interest to nonprofessional end users working with a fourth-generation language, it is often of crucial importance in the production systems built by professional developers, and it is almost always important to the end users of the application. Although it is true that the relative cost of computing power has decreased, it is still a major expense to upgrade computer processing power simply because a high-volume production system is inefficient.

The three-tiered approach

To achieve commercial standards of functionality, ease of use and performance, we chose to generate compilable Cobol from our PDL. Both our PDL and syntax-driven editor allow the developer to mix Cobol statements freely with the PDL as long as our structured programming standards are not violated. As a further enhancement to performance, terminal and data access commands in the PDL generate Cobol calls to high-performance assembly language subroutines.

To achieve commercial standards of software quality and reliability, our development environment uses a three-tiered approach:

- The environment strictly enforces structured programming techniques.
- The Cobol source-code generator checks PDL and Cobol code to ensure that all program control structures are closed.
- Access to all PDL, Cobol and assembly language code is controlled through a source-code management facility that archives all changes to source code.

In addition, as part of the source-code management facility, we have a comparator feature that will identify any and all differences between one version of any software module and any other, helping to ensure that we can control the configuration of any software system at every version, release or change level.

Fourth-generation languages that are predominantly procedural in nature give professional developers more control over software performance. They allow developers more freedom to use their knowledge of computers and design techniques to define efficient solutions to processing requirements.

Further, given existing technology, a fourth-generation language that generates compilable code can produce more efficient systems than one that uses an interpreter to execute its definitions.

We have found it possible to reap the benefits of fourth-generation technology and still provide professional software developers with the specialized tools they need to offset current weaknesses in fourth-generation languages. ■

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T-3 Strategic Planning for Corporate Information Networks

Leader: Dr. Howard Frank, Howard Frank Associates

Attend this tutorial to learn how to relate vendor offerings and technological trends to your organization's needs and requirements, and to develop a framework to plan future services and systems. You'll examine current issues in network integration, why communication departments must function as "mini telcos," and the pros and cons of software defined networks and private dedicated networks. *Level:* Introductory–Intermediate.

T-4 Planning and Designing Networks with the New Technology

Leader: Dr. John M. McQuillan, President, McQuillan Consulting

In this intensive seminar, you'll get acquainted with the key architectural principles used by today's leading network planners. You'll review emerging technologies such as T-1 networks, hybrids, VSATs, gateways between SNA, LANs and X.25, micro-mainframe links, intercompany networks, and more. *Level:* Advanced

T-5 Building the Network Management and Technical Control Facility

Leader: Gabriel Kasperek, President, Kazcom, Inc.

This one-day course will help you understand the strategic value of network control, explore alternative technologies for managing your network, and discover how to evaluate current technologies for use in your own organization. You'll become familiar with the test equipment you need for successful network control and understand industry trends and future directions. *Level:* Introductory–Intermediate.

T-6 Designing Voice and Data Networks under the New Tariffs

Leader: Robert L. Ellis, President, The ARIES Group Inc.

Take this tutorial to learn the structure of the post-divestiture tariffs, the latest January 1987 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics involved in configuring data networks, the LATA-pure strategy, and more. *Level:* Intermediate.

T-7 Managing the Telecommunications Resource

Leader: Gerald P. Ryan, President and Founder, Connections Telecommunications Inc.

This one-day course briefs you on how to develop a successful management environment. You'll learn what tools are available to do your job more professionally, how to plan a network management center, how to staff and train the department, and how to prepare and substantiate departmental budgets. *Level:* Intermediate.

T-8 IBM Token-Ring Versus Other LAN Choices

Leader: Dr. Kenneth J. Thurber, President, Architecture Technology Corp.

This tutorial gives you an across-the-board overview of announced products, future plans, compatible products, and IBM's overall strategy with respect to Token-Ring technology. You'll discuss the Token-Ring's relationship to IEEE 802.5 and get an in-depth look at NETBIOS and APPC/LU 6.2 interfaces, and more. *Level:* Intermediate.

T-9 VSAT Technology and Implementation

Leader: Dr. Jerome G. Lucas, President, TeleStrategies Inc.

Learn the basics of applying very small aperture terminal (VSAT) satellite communications to your networking needs. You'll get acquainted with basic application requirements in SNA networking, data broadcasting, PC networking, video broadcasting, and teleconferencing. *Level:* Intermediate.

T-10 IBM's Systems Network Architecture (SNA): A Detailed Road Map

Leader: Daniel Zatyko, President, Zatyko Associates

Enroll in this intensive one-day tutorial to understand the evolution of SNA, and learn fundamental SNA concepts, the seven SNA architectural layers, SNA's physical and logical addressing, strategic SNA products, components of NetView, Token-Ring networks, functionality and capabilities of the LU 6.2/APPC and NETBIOS interfaces, and more. *Level:* Intermediate.

T-11 An Introduction to Data Communications Today

Leader: Gary Audin, President, Delphi Inc.

This course introduces you to the basic concepts, terminology and technology of data communications. You'll learn how various networks operate and how to select them, how best to interconnect computers, terminals, and PCs using different protocols; and what software is necessary to support protocols and network management. *Level:* Introductory.

T-12 Understanding the Communications Regulatory Environment

Leader: Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Enroll in this tutorial to learn how telecommunications policy is made and changed, what agencies are active in policy making, how industry segments are affected by current policies, what key issues are now under consideration, and how you can influence future decisions. *Level:* Introductory.

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MANAGEMENT

TAKING CHARGE
William F. Zachmann

CIO: Fast track or dead end?

As information systems grow in importance, the idea that the department will assume a more prominent position within the organization has been actively promoted. It has been asserted that individuals responsible for information systems will take their place in the inner circle of top management as the chief information officer (CIO).

This implies that the post of CIO should become a viable path to the top executive position and that careers in information systems should therefore have greater upward potential than they have in the past.

Appealing as this picture may be for information systems professionals, the facts thus far do not offer unqualified support for advocates of a growing role for information systems and the CIO.

User and executive dissatisfaction with information systems seems to be growing in a number of organizations. While not yet a statistically significant trend, traditional centralized information systems units have been replaced recently by more decentralized organizations. Examples of information systems executives moving into top corporate jobs remain few and far between.

In May, at International Data Corp.'s Spring Executive Conference, Professor Jack Rockart, director of the Center for Information Systems Research at MIT's Sloan School of Management and an early supporter of the CIO concept, left more than a few jaws on the floor with

See CIO page 68

Zachmann is corporate vice-president of research for International Data Corp. of Framingham, Mass.

Sales drive DP at The Gap

Orientation leaves users and programmers happy

By Maura McEnaney

SAN BRUNO, Calif. — Jim Carolan looks like he plans to spend the day at the ballpark and not in the computer room. In his blue, short-sleeve polo shirt and jeans, Carolan's attire is atypical of the suited corporate systems planner or funky technical wizard.

Clothing is an important part of business for the vice-president of MIS at The Gap, Inc. In fact, selling casual clothing through its 641 stores is the company's business.

"We're a shirt-sleeve organization," Carolan says, half jokingly. But his interest in The Gap's business has helped him create an MIS department that has cut programmer turnover drastically and captured the respect of users, even as its budget has held steady for three years at about $9 million.

In the past two years, The Gap has revamped both its marketing efforts and its computer systems, helping boost fiscal 1985 sales to $647 million, up from $518 million the year before.

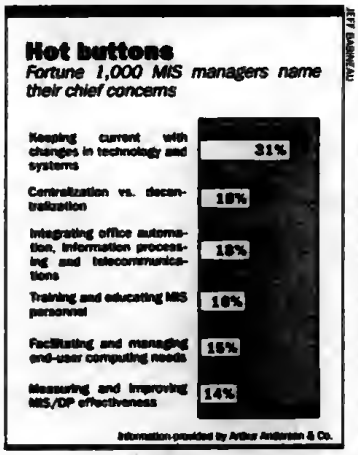
For its part, by getting programmers out of computer rooms and into the merchandising arena, Carolan's department is designing systems with a better understanding of The Gap's business and the bottom line. "We're not technology-driven, we're business-driven," Carolan says.

The Gap's Carolan

New programs in the merchandising department, for example, allow the distribution group to review the sales of any item on a day-to-day basis, making it easier to isolate fast-moving or slow-selling goods. "We now have the ability to take reorders and make changes in the goods much faster," says Rick Eastwick, director of planning and distribution for the men's department.

Two years ago, the merchandising division threw out "98% of the application systems because they were too cumbersome for users to access," Eastwick says. "Today those systems have been adapted

See SALES page 66



Study: MIS concern shifting to business

By David A. Ludlum

Top information systems managers are still preoccupied with keeping abreast of technology, but when prompted, they expressed greater concern with corporate goals, according to a recent survey by a major consulting firm.

The managers surveyed were nearly unanimous in saying that they believe information technology could give their firms a competitive edge, although few have made that potential a reality, the study found.

Despite suggestions to the contrary in the trade press, the managers indicated that application backlogs are a relatively

See MIS page 70

INSIDE

INSTANT ANALYSIS

"Nothing important is going to happen in the computer-integrated manufacturing area at a company unless the automation experts report to the top person in either manufacturing or engineering."

— Herb Halbrecht, Halbrecht Associates, Inc., Stamford, Conn.

MANAGEMENT MEMO

Trainers turn to market skill, teleconferencing, audio tape

Corporate information systems trainers turn to marketing techniques to promote use of new technology.

A seminar on marketing is aimed at information center staffers and data processing trainers. Thirty of them turned out in Boston this month for the first session of the Arnoudse & Ouellette Associates seminar, "Marketing Computer Technology Within Your Organization."

"You really have to listen to what they have to say if you want to market to them," said Paul Ouellette of the Manchester, N.H., firm.

Leaders of the one-day seminar discussed user resistance, goal setting, marketing techniques and the effective marketer and presented a case study.

■

"Teletraining" for computer users employs voice, data and image teleconference networks. Service providers include AT&T, regional phone companies and Multilink, Inc. of Lynn, Mass.

Insurers lead those using Multilink to train computer users "because they deal with so many independent agents," according to John Hassett, vice-president of sales and marketing at Multilink.

Customers equipped with headsets can use a voice-only network or add data communication and still, color video images of the subject matter or participants.

Instructors can read and manipulate data on students' screens.

■

Audio cassettes, an old training workhorse, generate renewed interest among computer users due to disappointment with computer-based training (CBT), an audio cassette vendor claims.

Audio cassettes guide prospective users through actual use of a program rather than just simulating it, says Lee McFadden, president of Fliptrack Learning Systems of Glen Ellyn, Ill.

But CBT vendor Advanced Systems, Inc. of Arlington Heights, Ill., says CBT is catching on as hardware costs fall and developers overcome a "lingering problem" with poorly designed programs.

Students want CBT programs that are easier to move about in and that provide more feedback, greater interaction and more extensive simulation, says Advanced Systems marketing executive John Woolsoncroft.

Sales drive Gap's systems

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to the selling process, and we now have the ability to react quicker to the retail business than we ever have before.

"The systems are easier to use because [MIS staff members] have taken an active role in the business," he says. "MIS is aware of what's going on because they come to our floor, they go to The Gap stores, they wear Gap clothes and they stroll around asking what's new. It keeps their interest high.

"They even adopted our terminology. They're not just stereotypical computer-heads," Eastwick says.

The Gap used to have "a standard data processing shop," Jim Brownell, director of computer services, says. "We had all the classic symptoms where we'd go off to build the system thinking we knew what users wanted." The shop had some major failures because systems didn't deliver as planned, he says.

Now, MIS project leaders and programmers often are urged to spend as much as half their time out of the computer department learning about the way The Gap works, studying, for example, how goods are moved from warehouse to store.

In a result that might spark envy among MIS managers elsewhere, programmer turnover is down to less than 10%, compared with 50% to 60% two years ago. Use of flextime and an optional four-day week have also helped.

Perhaps even more unusual is users' appreciation of MIS, which the users have shown openly. After MIS completed a set of new applications for the merchandising department last Christmas, the computer department was honored with an impromptu champagne party in The Gap's "merchandising laboratory" — a mock store used to experiment with different displays.

Merchandising is one of the MIS department's largest and most important users, and also the one with which it enjoys the best relationship, Carolan says.

Eastwick concurs. "There is more of a team environment here," he says. "We see them and they see us as a team that works to get the goods to the stores and sales to the bottom line."

Carolan does not take all the credit for his department's success in this mutual admiration society between yuppies in bright-colored cotton clothes. "The easiest systems to build are for the people who know exactly what they want," he says.

Survey predicts smaller year-end bonuses for DP

NEW YORK — Year-end bonuses for data processing professionals will be down about 20% from last year, according to a recent survey.

The bonuses will average 10.3% of base salaries this year, down from 13% last year, according to Edward A. Perlin Associates, Inc. of New York. "We attribute this decline to uncertainty about year-end financial results in companies throughout the economy," Perlin consultant Peter Tamblyn said.

Employers are relying increasingly on incentive compensation tied to profitability — such as bonuses — to attract and retain DP workers, the firm noted.

The anticipated decline in bonuses also stems from success by other corporate departments in competing for company resources, the firm said.

Overall salary growth

However, DP departments have maintained a lead over others in overall salary growth, according to Perlin spokesman Roger O'Connor.

"Although there is some moderation in growth, overall increases are averaging 8% in DP compared with about 5.5% for other parts of the companies," O'Connor said.

However, another recent survey by A.S. Hansen, Inc. found that average pay increases for DP workers have fallen to 4.3% this year from 6.1% in 1981.

CALENDAR

OCTOBER 5-11

Network Users Association Annual Fall Meeting. Denver, Oct. 6-8 — Contact: Teresa Robinson, National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

VSAT Expo '86. Washington, D.C., Oct. 6-8 — Contact: Telestrategies, 1355 Beverly Road, McLean, Va. 22101.

Information Management Exposition & Conference. New York, Oct. 6-9 — Contact: Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

Tenth International Fiber-Optic Communications and Local-Area Networks Exhibition. Orlando, Fla., Oct. 6-10 — Contact: Exhibit Coordinator, Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

Computer and Communications Security '86. New York, Oct. 7-9 — Contact: Cahners Exposition Group, Box 5060, Des Plaines, Ill. 60017.

PC Expo. Chicago, Oct. 7-9 — Contact: 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Performance Measurement Conference. Washington, D.C., Oct. 7-9 — Contact: TMSA Conferences, c/o Technology Training Corp., Dept. PMC, P.O. Box 3608, Torrance, Calif. 90510.

Dexpo West 86 Show. San Francisco, Oct. 7-10 — Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

National Conference on Factory Automation. Southfield, Mich., Oct. 7-10 — Contact: Software Career Link, 15 Olde Boston Square, 270 Littleton Road, Westford, Mass. 01886.

Fundamentals of EDP Auditing. New York, Oct. 9-10 — Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

Seybold Group's Conference on Desktop Communications. San Francisco, Oct. 9-11 — Contact: Seybold Group, Suite 132, 20695 Western Ave., Torrance, Calif. 90501.

OCTOBER 12-18

International Tandem Users' Group 1986 Fall Conference. Chicago, Oct. 12-16 — Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Computer-Aided Manufacturing-International's 15th Annual Meeting and Technical Conference. San Antonio, Texas, Oct. 14-15 — Contact: CAM-I, Inc., Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

National and Federal Office Automation Conferences. Washington, D.C., Oct. 14-17 — Contact: NOAC, P.O. Box N, Wayland, Mass. 01778.

Optical Publishing '86. Oct. 15-17, New York — Contact: Learned Information, Inc., 143 Old Marlton Pike, Medford, N.J. 08055.

Scan-Tech 86. San Francisco, Oct. 15-17 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15238.

Computer & Business Equipment Showcase. Atlanta, Oct. 16-18 — Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

OCTOBER 19-25

Central Prime Users Group Ninth Annual Meeting. Chicago, Oct. 19-21 — Contact: Computronics, 4N165 Wood Dale Road, Addison, Ill. 60101.

Eighth Annual Conference on Intelligent Copier/Printers. Monterey, Calif., Oct. 19-21 — Contact: Conference Registrar, Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Technetron '86. Boston, Oct. 19-22 — Contact: Wang Laboratories, Inc., Mail Stop 1935, One Industrial Ave., Lowell, Mass. 01851.

Third-Party and Self Maintenance Conference. New York, Oct. 20-21 — Contact: Frost & Sullivan, Inc., Department RE-828 E, 106 Fulton St., New York, N.Y. 10038.

Index '86. Boston, Oct. 20-22 — Contact: Executive Director, Wang Users Society of America, P.O. Box 174, De

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CIO: Fast track or dead end?

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a talk entitled, "The Line Manager Takes The Leadership."

Rockart emphasized that line management's awareness of information technology is growing and suggested that the future will find information systems in a partnership with line management, which would be the controlling partner.

As I have pointed out numerous times, we are in a period of fundamental change in the technologies of information. Increasingly standardized, networked, microprocessor-based systems provide more flexible and less expensive solutions. Much of the practice of developing information systems must be adapted for organizations to realize the benefits of new technology. Simply expanding the use of large mainframe systems will not be adequate.

At the same time, the importance of information systems to the enterprise is growing dramatically. Senior corporate management is beginning to understand that effective information systems are not only essential to efficient management but also powerful tools for competitive effectiveness.

This growing recognition is both a blessing and a curse for information systems management. On the one hand, it means the information systems department's mission will gain prominence and recognition within the organization. On the other hand, it results in even greater demands on the division.

Further complicating matters is the impact of the shock troops of the microprocessor revolution — personal computers. Before 1980, information technology was securely in the hands of the experts. Personal computers, like the easy-to-learn Phoenician script adopted by the ancient Greeks, acted as a profound democratizing influence.

The backlog of application requests from user organizations was often a sore spot between information systems and users even befors the micro. As users became more familiar with computers through their own experience with PCs, they sometimes gained a greater appreciation of what was involved in building systems. More frequently, however, users discovered they could do things that information systems experts had long said were not feasible or required resources that were not available.

It did not help that the information systems departments in many organizations were slower than the users to get on board with personal computers or that, when they did get on board, they often seemed more interested in gaining control by dictating standards or acquisition policy than in assisting users.

Small wonder, therefore, that dissatisfaction with information systems has grown in a number of organizations. When that dissatisfaction has been felt by senior user management, the consequence has sometimes been the end of information systems as previously constituted. Instances are not numerous enough to call it a trend, but the decentralization of information systems has become corporate policy for quite a few large companies over the past year or two.

A typical pattern is for application development personnel to be divided among operating divisions. A centralized data center operation is typically maintained. Corporate information systems then become a high-level staff function with responsibilities such as planning, technology assessment, coordination, standards development and so forth.

Decentralization of the function need not be motivated by dissatisfaction with it. Nor does decentralization and the movement to a staff role necessarily imply loss of influence. It can actually mean a substantial increase in importance.

In any event, if a strong trend toward decentralization is developing, it may be worth asking whether it is likely to be for the good of the enterprise.

Responsibility, authority coincide

Certainly a fundamental rule of good management is that a manager's span of responsibility and authority should coincide. To the extent that a centralized information systems division is beyond the direct control of line managers that it serves, it violates that rule.

On the other hand, for most organizations, it is increasingly critical that information systems be dealt with *as a whole*. One of the most important opportunities new technology offers is that of bringing together individual applications into an integrated and coordinated electronic nerve system that enables the enterprise to be more effective, more responsive to the marketplace and better able to serve its customers.

Scattering information systems to the winds by dividing it among operating divisions, while perhaps a momentarily satisfying way to relieve frustration over its performance and superficially consistent with proper span of control, is hardly an assured route to long-term maximization of the benefits of modern information technology. Such a move is likely to make it more difficult to build the kind of integrated corporate systems that will be required for competitiveness in the future.

Ultimately, of course, the real question is not one of centralization vs. decentralization. Rather, it is whether the organizational structure and the professionals within it are able to build an effective corporate information system responsive to the needs of the enterprise.

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MIS concerns shifting direction

From page 65

minor concern.

According to the survey, the managers expect issues of increasing importance to include the degree of information systems centralization and the management of end-user computing and data bases.

These are among the conclusions from a survey of 120 top information systems executives at Fortune 1,000 firms, which was commissioned by Arthur Andersen & Co. The survey was conducted last spring by an independent research firm, and the results were released this month.

The findings underscore the shift in attention of top information systems managers from technical to business issues, said William Wike, a consultant with Arthur Andersen's Chicago office.

Gaining the competitive edge

"They're changing from being a bits-and-bytes-type person," Wike said. "We see this shift from using information in these backroom-type roles to using it to gain competitive advantage."

Researchers attempted to tap the thoughts of the managers — the top information systems executive at each company — through various means.

The managers were first asked to express their chief concerns. Next, they were asked to relate what they discuss with their supervisors as well as what changes they foresee in coming years.

The researchers then asked the managers to rate the importance of 22 issues presented to them and sought their views on seven key issues, asking whether the managers agreed or disagreed with a series of statements.

When asked to list their chief concern, 31%, by far the largest portion, said it is keeping abreast of technology. Next came the issue of centralization vs. decentralization and then that of integrating office automation, information processing and telecommunications, both cited by 18%.

But when the managers rated 22 issues according to degree of concern, the most common response was translating information technology into competitive advantage, which was cited by 13%. That was followed by centralization vs. decentralization, cited by 9%.

On the issue of competitive advantage, 97% of the managers said they recognized information technology as a real or potential means of achieving this goal.

But a much smaller portion said they are now taking advantage of technology as a means of attaining competitiveness: 19% reported doing so by delivering better information to managers, 15% through improved customer service, 8% through better cash management and 7% by supporting product development.

"They all want to [use information technology]. Actually doing it is another thing," Wike said.

Application backlogs

In what Wike termed a surprising finding, managers expressed relatively little concern with application backlogs.

When presented with a list of statements, 14% agreed that the backlog is their biggest problem. But earlier, only 3% volunteered backlogs as their primary concern, and only 4% said it would be a major issue in the next two or three years.

"My evaluation of that is that they know how to control the backlogs — they are comfortable with a technical issue compared with the other things they are wrestling with," Wike said.

When asked what they discuss with their supervisor, the managers' most common response was, again, keeping abreast of technology, cited this time by 20% of the managers. Next was measuring and improving the effectiveness of information systems, cited by 19%, and centralization vs. decentralization, cited by 14%.

Asked what they expected their top concerns to be over the next two or three years, 21% of the managers said centralization vs. decentralization, 18% said facilitating and managing end-user computing and 12% said managing information resources.

Among other findings of the survey were the following:

- Nearly half the respondents are changing the degree of information systems centralization, with 64% of those becoming less centralized for benefits such as quicker response time and more effective application development. Those involved in centralizing cite greater control of information processing and costs as chief concerns.
- Nearly 40% of the managers said their companies have a chief information officer, with 38% of those reporting to the chairman, chief executive or president and 32% to an executive such as the chief financial officer.
- Almost half of the chief information officers were hired from outside the company; 68% of them came from an MIS department and 21% from finance or accounting.
- Slightly more than half the respondents — 57% — have an information plan, with 75% of those having implemented it in the last two years. More than three-fourths of the plans call for identifying moves for competitive advantage.
- About one-third of the respondents said they or their department do not undergo a formal, objective performance measurement.
- The most desired attribute sought in hiring staff, cited by 71% of respondents, was the combination of people skills and technical skills.

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Uniscope. New York, Oct. 20-22 — Contact: National Expositions Co., Suite 12A, 49 W. 38th St., New York, N.Y. 10018.

Infomatics '86. Toronto, Oct. 20-23 — Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

American Production and Inventory Control Society 29th Annual International Conference and Technical Exhibit. St. Louis, Oct. 20-24 — Contact: APICS, 500 W. Annandale Road, Falls Church, Va. 22046.

Electronic Linkage of International Markets. New York, Oct. 21 — Contact: Waters Information Services, Inc., P.O. Box 2248, Binghamton, N.Y. 13902.

International Symposium on Methodologies for Intelligent Systems. Knoxville, Tenn., Oct. 21-25 — Contact: University of Tennessee, Department of Conferences, 2014 Lake Ave., Knoxville, Tenn. 37996.

Software Configuration Management and Software Quality Assurance. Santa Maria, Calif., Oct. 22-24 — Contact: Software Certification Institute, P.O. Box 2328, Santa Maria, Calif. 93455.

Tenth Annual Data Entry Management Association Conference and Equipment Exposition. Las Vegas, Oct. 22-24 — Contact: DEMA, 750 Summer St., Stamford, Conn. 06901.

International Computers & Communications 1986-2000. Washington, D.C., Oct. 22-25 — Contact: IC&C, P.O. Box 17392, Washington, D.C. 20041.

Seventh Annual Computer Law Institute. New York, Oct. 23-24 — Contact: Law & Business, 855 Valley Road, Clifton, N.J. 07013.

OCT. 26-NOV. 1

Digital Document Automation: The Emerging User. Reston, Va., Oct. 26-28 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

American Trucking Association Fall Workshop and Systems Demonstrations. New Orleans, Oct. 26-29 — Contact: ATA Management Systems Department, 2200 Mill Road, Alexandria, Va. 22314.

International Data Corp.'s MIS Executive Conference. Palm Springs, Calif., Oct. 26-29 — Contact: IDC, 5 Speen St., Framingham, Mass. 01701.

Fifth World Congress on Medical Informatics. Washington, D.C., Oct. 26-30 — Contact: George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

Annual Teleconferencing Users Conference. Anaheim, Calif., Oct. 27-29 — Contact: Applied Business Telecommunications, Box 5106, San Ramon, Calif. 94583.

Data Processing Management Association Annual Computer Conference and Business Exposition. Atlanta, Oct. 27-29 — Contact: DPMA International, 505 Busse Highway, Park Ridge, Ill. 60068.

Hammer Forum 86. Cambridge, Mass., Oct. 27-29 — Contact: Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

Optimizing Software Productivity and Quality. Arlington, Va., Oct. 27-29 — Contact: Marriot Crystal Gateway, 1700 Jefferson Davis Highway, Arlington, Va. 22202.

Token-Ring Vendor Forum. San Jose, Calif., Oct. 29 — Contact: Network Strategies Group, 1436 Koll Circle, San Jose, Calif. 95112.

Distribution Computer Expo '86 East. Parsippany, N.J., Oct. 29-30 — Contact: C.S. Report, Inc., P.O. Box 453, Exton, Pa. 19341.

Applications of Artificial Intelligence and Expert Systems. Arlington, Va., Oct. 29-31 — Contact: Learning Technology Institute, 50 Culpeper St., Warrenton, Va. 22186.

Association of Public Data Users 11th Annual Conference. Washington, D.C., Oct. 29-31 — Contact: APDU, 87 Prospect Ave., Princeton, N.J. 08544.

Computer Dealers and Lessors Association Annual Meeting. Colorado Springs, Oct. 30 to Nov. 1 — Contact: CDLA, 1212 Potomac St. N.W., Washington, D.C. 20007.

NOVEMBER 2-8

Fall Joint Computer Conference '86. Dallas, Nov. 2-6 — Contact: Stanley Winkler, FJCC '86, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

NEW PRODUCTS

Macintosh PC to Wang VS interface out

Dataviz, Inc. of Norwalk, Conn., and Omnigate, Inc. of San Francisco have announced the development of a two-way interface between the Apple Computer, Inc. Macintosh personal computer and the Wang Laboratories, Inc. VS computer.

The interface is said to make it possible to translate and transfer files directly between the two systems.

According to the vendor, it also allows Macintosh users to access VS disks, word processing libraries, data files and other Wang applications, such as Wang Office, via standard Macintosh menus and dialogues.

The interface is a combination of Dataviz's Maclink Plus product and Omnigate's Allegro Server software. Allegro Server converts text files created on a PC into editable Wang documents using Xon/Xoff protocol for text file flow control.

Incorporates the Xmodem protocol

It incorporates the Xmodem error-free protocol that allows transfer of binary image files between the VS and any computer that supports Xmodem, the vendor said.

The combination of the Maclink Plus and Allegro Server reportedly allows the Macintosh user to retain full Macintosh capabilities while utilizing the data capabilities of the Wang VS.

The Allegro Server Maclink Plus module, which layers on top of Allegro Server's main module, is priced at $2,000.

The Maclink Plus VS software is priced at $250 per Macintosh computer.

CORRECTIONS

The V/SMD 4200 Cheetah by Interphase Corp. [CW, Aug. 25] boosts direct memory access throughput to 30M byte/sec.

Lifeline II uninterruptible power system from Instrumentation and Control Systems, Inc. [CW, Sept. 1] has a capacity of 1,000W.

ADDS terminal fits DEC

The ADDS 3220, a Digital Equipment Corp. VT220-compatible terminal, has been introduced from Applied Digital Data Systems, Inc., a Hauppage, N.Y.-based company.

Available now, the ADDS 3220, said to be compatible with the DEC VT220 as well as the DEC 100 and 52 and with the ANSI X3.64 command set, is priced at $695.

According to a company official, built-in features of the terminal include VT220-compatible setup mode, improved presentation with double-high characters and VT220-compatible keyboard layout with six additional function keys. Also included are host- and user-programmable function keys, which are available in all modes, and smooth scroll speed which can be selected from the keyboard.

The ADDS 3220 has a 14-in., flat-face CRT, said to offer reduced glare, that is available in green, white or amber. It has a 70Hz refresh rate to eliminate flicker, and display is 24 by 80 lines or 132 columns selectable.

With 22 nonvolatile function keys, the 3220 reportedly has six more keys than DEC terminals. Its keys are functional in VT100 mode or VT220 mode. A labeling strip is included on the keyboard for identifying operator-programmed keys.

Applied Digital Data Systems' ADDS 3220

Other features on the terminal are a bidirectional printer port and standard green, nonglare tilt-and-swivel monitor. A multilingual setup mode for language selection in English, French or German is also available. A programmable font, capable of generating all 16 DEC multinational character sets, is also available, a company official said.

Legal billing software announced

Time and billing software for law offices that provides direct access to client billing from local workstations has been announced by the Legal Systems Division of Informatics General Corp., a subsidiary of Sterling Software, Inc.

The software, called Fastpath, will be available in the fourth quarter at a price ranging from $7,000 up to $15,000 with yearly maintenance charges, depending on the number of system users.

Fastpath is an optional module for the Informatics Legal Time Management System, a spokesman for the Phoenix-based company said.

Fastpath will allow multiple users to review, process and edit a bill at a terminal.

Streamlined memo selection reportedly allows a user to select a billing memorandum based on a combination of user-defined criteria.

Screens have been designed to encourage quick text and content editing of the bill process, according to company officials.

Fastpath's bill edit and realization entry program are said to combine the functions of entering billing and realization, text editing a bill, content edit of a bill and transfers of work-in-process transactions.

The system's custom audit trail indexing feature allows audit trail information for each bill to be summarized and written to a data file on the disk.

According to the company, through the use of Wang System Utilities from Wang Laboratories, Inc., the file can be sorted, selected and printed in a report that was designed by the firm.

Fastpath runs on Wang computers.

INSIDE

SOFTWARE & SERVICES

Systems software

Personnel Asset Management System, a human resource control system for the IBM System/36, has been introduced by **GMD, Inc.**

The major areas covered by the system are organization, recruitment, absenteeism control and personnel training and development.

The package also includes user-defined tables for all classification codes, two levels of security and a memo-posting system. Other features include an interface to the System/36's Query facility that allows generation of ad hoc reports.

The System/36 version of the software costs $9,000.

GMD, 3091 E. Shadowlawn Ave. N.E., Atlanta, Ga. 30305.

Applications packages

GMD, Inc. has introduced Product Data History software.

Product Data History software is said to create archival history files for IBM's Manufacturing, Accounting and Production Information Control System (MAPICS) orders, bills of material and routings and inactive master records.

The stored data is extracted from the MAPICS product data management files and written to history files stored on diskettes.

Features of the software include saving and retrieving manufacturing order details by specific order number, item number or customer job number; saving and retrieving product details; and automatic creation of on-line diskette indexes for use in retrieving archived information.

Product Data History operates on an IBM System/36 for users in MAPICS 1 or II environments.

The software costs $2,000.

GMD, 3091 E. Shadowlawn Ave. N.E., Atlanta, Ga. 30305.

Utilities

Sterling Software, Inc.'s Dylakor Division has released its Dyl-Online under TSO/ISPF Version 2.1 with an interface to the company's auditing system.

One of the features reportedly is a faster installation procedure. The added Dyl-Audit is said to allow users to perform letter writing, linear regression and function sampling in both an on-line and batch mode. The added on-line capability reportedly allows users to generate and evaluate reports on-screen before printing.

The package runs on IBM MVS systems.

Version 2.1 of Dyl-Online under a TSO/ISPF costs $6,000.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■

Ideassociates, Inc. has introduced the **Ideacomm 3287** printer emulator, which allows any personal computer printer to be programmed to emulate the IBM 3287 mainframe printer.

Ideacomm 3287 was designed to work with the existing Ideacomm 3278 terminal emulation board. The Ideacomm 3287 software-driven printer control panel is said to duplicate all the features of the 3287 printer such as lines per inch, test, error code, spacing and reset.

The Ideacomm 3287 costs $795.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821.

■

Chi/Cor Information Management, Inc. has introduced **Offsite Data Auditor**.

The Offsite Data Auditor is said to identify those computer files that must be stored off-site in order to recover the business application programs in case of a disaster. According to the vendor, the software optionally interfaces with most tape management systems to verify that the computer files required for recovery are stored off-site.

Offsite Data Auditor runs in a 256K-byte region, under IBM OS/V81, MVS or MVS/XA operating systems.

The software is priced at $7,000.

Chi/Cor Information Management, 10 S. Riverside Plaza, Chicago, Ill. 60606.

■

Grocer Technology has introduced the **Utility Trilogy**, a utility package for the IBM System/38.

The Utility Trilogy features the following modules: an application manager said to produce cross-reference reports from the User Library List or from selected libraries; a network manager that produces a report of control units, attached devices and lines; and Disk Manager, said to produce a report of disk usage by library. With the Disk Manager, information by object type within the library is reported with the percent of disk space used.

The Utility Trilogy costs $100 per module or $200 for the complete package.

Grocer Technology, P.O. Box 10054, Atlanta, Ga. 30319.

■

Unicom Systems, Inc. has announced **Automon/CICS 1.2**, a facility for IBM CICS/VS systems.

Automon/CICS 1.2 is said to identify various problems and take corrective actions to prevent system crashes. According to the vendor, Automon/CICS 1.2 also improves system performance and escalates on-line productivity. Features include system loop detection, application

Continued on page 76

Doesn't your IBM PC deserve IBM service?

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Address_____

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Continued from page 74

loop correction, short on storage prevention, storage violation detection and automatic logging of CICS changes.

Automon/CICS 1.2 is priced from $5,000 up to $19,500.

Unicom Systems, 5060 Chimineas Ave., Tarzana, Calif. 91356.

■

Ibimaint USA, Inc. has announced **Save Program Space (SPS)**, a software tool.

SPS is said to be able to save about 60% of the disk space used to store object programs on an IBM System/38. The software results in higher speed Save-Copy-Restore operations as well as significant time savings with the use of tape units, the vendor stated.

SPS operates by directly addressing an entire system library and searching the control program facility for the availability of the relative debug space occupied.

SPS software is priced at $2,900.

Ibimaint USA, 3 Hutton Center Drive, Santa Ana, Calif. 92707.

■

Language Processors, Inc. has ported its **LPI-PL/1 compiler** to Sun Microsystems, Inc. Sun-3 workstations.

LPI-PL/1 is said to feature a sophisticated optimizer that performs both local and global optimizations. It operates with an interactive source-level debugger said to allow developers to test programs using the conventions and symbols of the source language. It also offers trace facilities and a flexible set of breakpoint controls.

LPI-PL/1 is used for computer-aided design and manufacturing applications.

LPI-PL/1 costs $2,000 for Sun-3 workstations and $9,000 for Sun-3 file servers.

Language Processors, 400-1 Totten Pond Road, Waltham, Mass. 02154.

Training software

Release 2.0 of **IDMS**, one of a series of computer-based training courses in data processing, has bowed from **Synerlogic, Inc.**

The eight-hour course introduces IDMS structure, environment and statements. It is organized in three learning units, according to the vendor.

Learning unit 1 deals with records and sets, physical structure and data structure; learning unit 2 deals with operating environment, currency concepts and record and area locks; and learning unit 3 deals with data management language (DML) control statements, DML Retrieval statements and Erase and Save statements.

Synerlogic's IDMS is priced at approximately $1,315 for a perpetual license.

Synerlogic, Suite 1300, 635 8th Ave. S.W., Calgary, Alta. T2P 3M3.

MICROS

Software applications packages

Technical Software Associates, Inc. has introduced **Secureware**, an automated security management system said to protect proprietary information and assets.

Secureware is said to be able to keep track of security information including personnel, documents, containers, restricted areas and equipment. The software stores information for several thousand records and provides a direct audit trail between personnel, documents, containers and location.

Secureware software costs between $1,000 and $2,000. It runs on an IBM Personal Computer XT, Personal Computer AT or compatible.

Technical Software Associates, Suite 325, 1400 Lake Hearn Drive, Atlanta, Ga. 30319.

■

Generic Software, Inc. has announced **Autodimension**, a module for use with Generic's computer-aided drafting and design (CADD) software.

Autodimension is said to be a fully featured, automatic way of adding dimensions and legends to computer-generated drawings.

The module generates linear and angular dimensions and allows the user to generate extension lines, labels and arrowheads automatically.

Text entries can be horizontal, vertical or aligned. Autodimension also gives us-

ers the choice of adding dimensions on a separate layer so that they can view a clean drawing.

Autodimension costs $49.95.

Generic Software, 8763 148th Ave. N.E., Redmond, Wash. 98052.

Software utilities

Worthington Data Solutions has announced **Barres**, a random-access memory (RAM)-resident bar code printing program that can be utilized through most user programs, including word processors.

Barres reportedly prints UPC, Code 39 and Interleaved 2 of 5 and occupies 8K bytes of RAM. Written in assembly language, it drives the printer at maximum speed in normal text printing and in bar code printing.

Barres requires IBM PC-DOS or Microsoft Corp. MS-DOS Release 2.0 or higher with an IBM Proprinter, any Epson America, Inc.- or IBM Graphics-compatible printer.

Barres is priced at $179.

Worthington Data Solutions, 130 Crespi Court, Santa Cruz, Calif. 95060.

Software enhancements

Brooks Scientific, Inc. has added **three-dimensional plate** and **three-dimensional solid heat** transfer elements and an **eight-node quadrilateral** element to its Pctran Plus finite-element package for microcomputers.

The 3-D plate and 3-D solid heat transfer elements reportedly can be used for steady-state heat transfer problems with temperature constraints and convectives, heat flow and heat-generation loads.

The eight-node quadrilateral element is said to enable the advanced modeling of complex geometries.

The Pctran program runs on the IBM Personal Computer XT, Personal Computer AT and compatibles.

The Pctran base module, with the additions, is priced at $1,295.

Brooks Scientific, 55 Wheeler St., Cambridge, Mass. 02138.

■

Financial Decision Systems, Inc. has released a **General Ledger Interface option** for Corptax Linx Version 3.1, a micro-based tax trial balance system.

The general ledger interface allows the user to convert a financial-based general ledger file into income tax return format with complete audit trail reports. It runs on the IBM Personal Computer, PC XT and AT.

The option costs $1,000.

Financial Decision Systems, Suite 1000, 28035 Dorothy Drive, Agoura Hills, Calif. 91301.

Communications

Dialogic Corp. has announced the **AMX-80** audio multiplexer.

The multiplexer is said to provide call-referral features allowing the transfer of up to eight incoming telephone calls to local attendants through attached telephone sets.

The product consists of an expansion board, requiring a single slot in an IBM Personal Computer XT, AT or compatible.

The AMX-80 costs $595.

Dialogic, 60 Baldwin Road, Parsippany, N.J. 07054.

How COMPAQ® advanced personal

Introducing the new COMPAQ DESKPRO

COMPAQ announces a major improvement to the industry standard, one that carries you far beyond the limits of today's "advanced-technology" personal computers. It's the new COMPAQ DESKPRO 386,™ and it reaches far higher levels of speed, compatibility, performance, and expandability than have ever been attainable in personal computers. Dozens of separate enhancements have been combined in one desktop computer to make the COMPAQ DESKPRO 386 the most advanced personal computer in the world. There's no personal computer more ideal for power users, networking and connecting to mainframes.

The new high-speed, 32-bit, 16-MHz Intel® 80386 microprocessor forms the heart of this breakthrough. It's the latest from Intel's family of microprocessors ™

that now power well over nine million industry-standard PCs. As such, it single-handedly runs all the popular business *and* engineering software you already own two to three times faster than ever *and* lets you do things today never before possible on personal computers. Plus it's compatible with industry-standard

The most advanced personal

advanced-technology computers

hardware and expansion boards already available. But the chip is only the beginning of this story.

Each component the very best

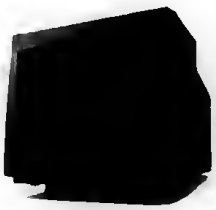
Performance enhancements go far beyond the microprocessor. Every component has been optimized to take advantage of the increased speed and power of the 80386.

We offer you, for instance, much more memory than most other advanced-technology personal computers. Plus more storage with faster access. A built-in lightpen interface. And even a built-in expanded memory manager.

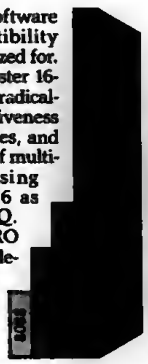
We quadrupled the capacity of the internal fixed disk drive backup to 40 Megabytes and made it twice as fast as before. We also improved the keyboard, enhanced color graphics, then added a one-year limited warranty. Together, they make this the most advanced personal computer available, and the very first to offer a true minicomputer level of performance in an industry-standard desktop computer.

The winning numbers

The new COMPAQ DESKPRO 386 features advanced 32-bit architecture that processes twice as much information as 16-bit computers in the same amount of time. Yet it retains the unparalleled software and hardware compatibility that COMPAQ is recognized for. Coupled with a much faster 16-MHz processing speed, it radically improves the responsiveness of spreadsheets, databases, and networks, and the ease of multitasking, especially using XENIX® System V/286 as published by COMPAQ. The COMPAQ DESKPRO 386 will also allow the development of powerful new business programs, more advanced engineering software, and artificial intelligence applications.



The COMPAQ Color Monitor works with software designed for a wide variety of display standards: EGA, CGA, and monochrome.



The Intel 80386 microprocessor is faster and more powerful than its predecessors.

More of everything

Count on more memory, storage, flexibility, connectability and compatibility for starters. For instance, you can now break the 640K memory barrier *and* use up to 8 Megabytes of high-speed, 32-bit RAM with the COMPAQ Expanded Memory Manager. This software comes standard with the COMPAQ DESKPRO 386 and works with applications that follow the Lotus®/Intel/Microsoft® (LIM) Expanded Memory Specification, allowing you to build bigger spreadsheets, sort larger databases and run more programs.

Get up to 10 Megabytes of RAM without using a single expansion slot; up to 14 Megabytes in all. And get up to 4 internal storage devices. Now you can access even more data faster. Actually 50 to 150 percent faster with our 40-, 70- and 130-Megabyte internal fixed disk drives, the fastest in the industry.

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COMPAQ reached the Fortune 500 faster than any other company in history because our products work better. The COMPAQ DESKPRO 386 combines superior technology with COMPAQ innovation to offer capabilities you won't find anywhere else.

Some companies may copy one or two of its features, but it will be years before they copy them all. This attention to engineering detail is shared by all COMPAQ Personal Computers, which is why each is the best in its class. And why COMPAQ has the highest user satisfaction ratings in the industry.

The new COMPAQ DESKPRO 386 is available only from over 3,000 Authorized COMPAQ Computer Dealers located worldwide. These computer professionals have already proven their expertise in providing computer users complete business solutions to meet a variety of needs.

For the Authorized Dealer nearest you, or to obtain a brochure, call 1-800-231-0900 and ask for Operator 27. In Canada, call 416-449-8741, Operator 27.

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It simply works better.

computer in the world

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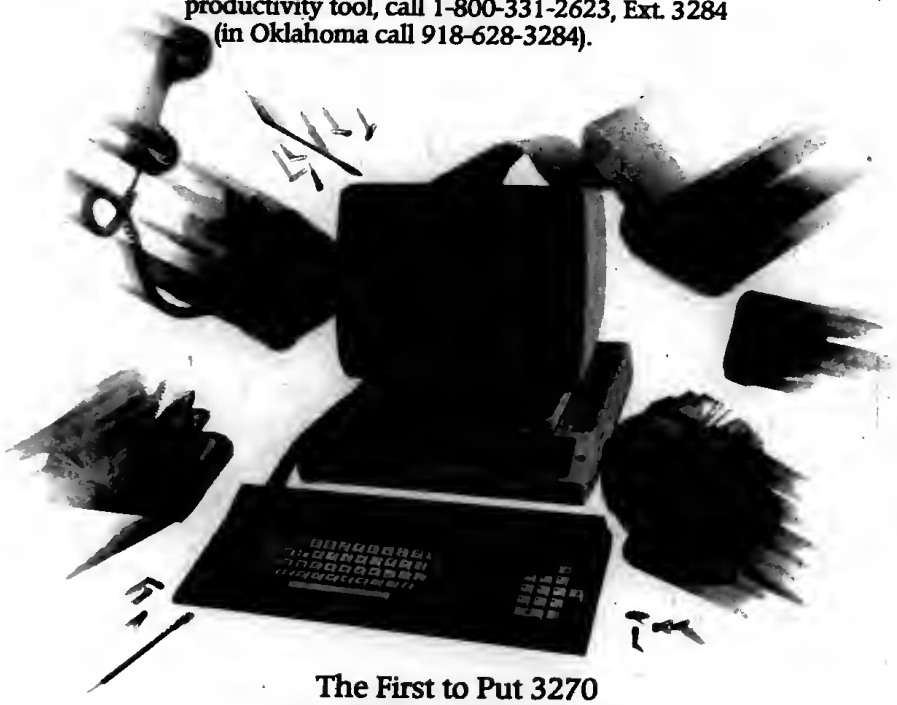
Cleans desks and does windows with one keystroke.

Reduce functions typed from the keyboard to just one keystroke.

Introducing the new C078 Combined Function Terminal. A new, innovative terminal for improving operations in Credit Collections, Purchasing, Customer Service, and many other areas.

Now a 3270 plug compatible terminal that combines telephony, user functions, and interactive data all in one. With programmable soft keys you clear the desk of calendar, calculator, notes, and telephone.

The new Telex C078 Combined Function Terminal. To put your finger on this new productivity tool, call 1-800-331-2623, Ext. 3284 (in Oklahoma call 918-628-3284).



The First to Put 3270 Compatibility and Productivity on Speaking Terms.

TELEX.

TELEX COMPUTER PRODUCTS, INC.

Printers/Plotters/Peripherals

C. Itoh Electronics, Inc. has introduced its **9700 dot matrix printer.**

The Model 9700 features a 136-col., 24-wire head and a 16-digit LCD function display. It offers four emulation modes, including the IBM Prowriter and Epson America, Inc. LQ1500. Print speed is 250 char./sec. in draft mode and 100 char./sec. in letter-quality mode. For graphics applications, resolution is up to 180 by 240 dot/in.

Other features include parallel interface, bidirectional character printing and both tractor and friction feed. Although standard output is black, users can optionally upgrade the printer for color performance.

Model 9700 costs $1,395.

C. Itoh, 5301 Beethoven St., Los Angeles, Calif. 90066.

COMMUNICATIONS

Controllers

Applitek Corp. has released its **EI10 network interface unit.**

The unit is said to allow Applitek users to build networks that combine Applitek's Unilink protocol for high-throughput, backbone networks with carrier-sense multiple access with collision detection standard subnets.

Using the Unilink interface, network control is provided on networks over 17 miles, the vendor stated. The EI10 interfaces four or 10 terminals using asynchronous or synchronous protocols through RJ45, RS-232 or RS-449 interfaces. It operates at 10M bit/sec. on broadband and baseband as well as fiber-optic networks.

The EI10 is priced from $310 per port.

Applitek, 107 Audubon Road, Wakefield, Mass. 01880.

■

Cabletron Systems, Inc. has introduced its **ST-500 Ethernet and IEEE 802.3-compatible transceiver.**

One of the features of the ST-500 is Lanview, which is composed of five LED circuits that detect network activity and assist in locating node and network problems. The LEDs indicate packet transmission, packet receive, collision presence, heartbeat enabled and power. Another feature of the ST-500 reportedly allows the user to enable or disable the heartbeat test by means of a jumper, which allows the user to inventory only one transceiver type.

The ST-500 costs $250.

Cabletron Systems, P.O. Box 6257, East Rochester, N.H. 03867.

Voice/data communications

Rolm Corp. has announced the **CAS II 9000 branch,** an enhancement to its **Centralized Attendant Service** (CAS).

CAS provides centralized telephone attendant service in organizations with multiple sites that are located in the same geographic region, the vendor said. The CAS II 9000 branch is said to allow incoming calls from a Rolm computerized branch exchange II 9000 business communications system to be routed directly to a CAS center. Calls are prioritized by call type, such as internal operated-assisted calls, external calls or recalls.

The 15-node CAS II 9000 branch costs $11,000.

Rolm, 4900 Old Ironsides Drive, Santa Clara, Calif. 95054.

Software

Computer Application Services, Inc. has announced **Release 1.5.5 of EMS,** its electronic mail system.

The release supports an LU6.2 gateway to other EMS systems. The revisable forms facility allows formatted screens to be created by any EMS user and sent to any other user. Additional features with Release 1.5.5 include synchronous data link control to Western Union Corp.'s Easylink, expanded edit features and a copy message function.

EMS runs on IBM mainframes running IBM's CICS. Some gateways may require VTAM or BTAM.

EMS costs $9,500 for DOS/VSE and $12,500 for OS/MVS.

Computer Application Services, 15560 Rockfield Blvd., Irvine, Calif. 92718.

Network services

GTE Telenet Communications Corp. has offered its **PC Pursuit** microcomputer communications service to small and medium-size businesses and announced expanded geographic coverage.

The service provides CCITT X.25 packet-switching data communications between microcomputers 24 hours a day through the Telenet data network.

The service is said to be suited to businesses with communications volumes of less than 200 connect-hours per month.

Evening and weekend use costs $25/mo; daytime use costs $10.50/hour or $14/hour.

GTE Telenet Communications, 12490 Sunrise Valley Drive, Reston, Va. 22096.

Test equipment

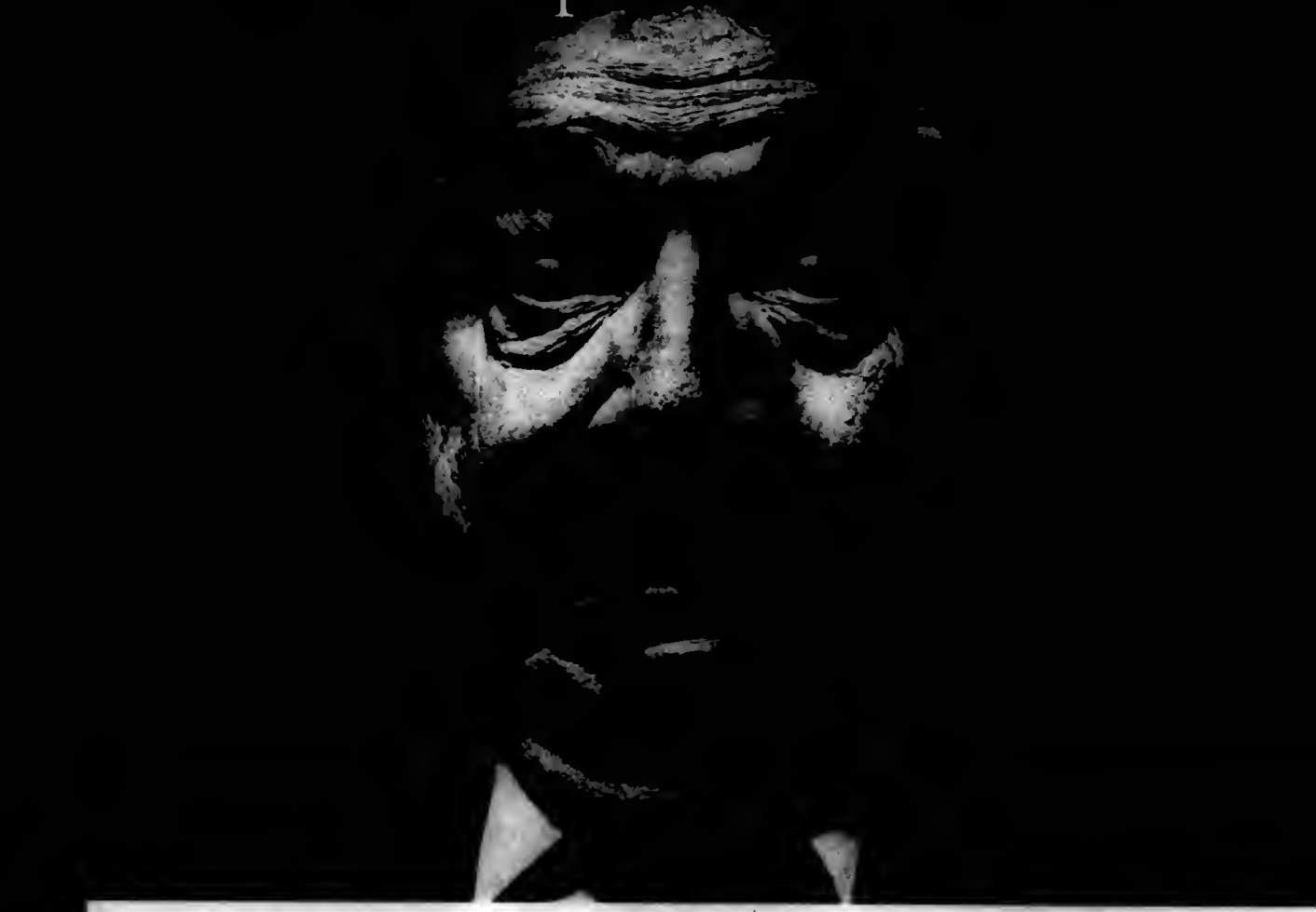
Datatran Corp. has introduced the **Minitracker-Plus** and the **Pulse-Tracker,** said to aid in the installation and troubleshooting of RS-232 interfaces.

The Minitracker-Plus is a pocket-size RS-232 signal monitor said to allow monitoring of all 24 synchronous and asynchronous signal lines simultaneously.

The Pulse-Tracker is said to be a passively powered RS-232 pulse trap capable of detecting any pulse or data activity on any two signal lines

Continued on page 83

Watch what happens next time you ask a mainframe software vendor for a complete customer list.



You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

Data Design doesn't balk at giving prospective customers a *complete* customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions, and more.

You'll find that people who want financial software relief choose Data Design. Since 1973, nationally recognized independent software surveys have confirmed Data Design's unsurpassed record of user satisfaction—year after year. That's why we'll give you a complete customer list—and *they* won't.

So, if you're in the process of looking at mainframe financial software for your company, put Data Design on your list. Then tell the other vendors on it you're also looking at Data Design. And watch what happens.

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Continued from page 81

simultaneously. It can be used to detect software handshake signals while interfacing equipment or to identify long-term, intermittent problems in modems and communication lines.

Minitracker-Plus and the PulseTracker cost $49.95 each.

Datatran, 355 Yuma St., Denver, Colo. 80223.

SYSTEMS & PERIPHERALS

Terminals

Monitronix Corp. has introduced its **MX-4190** high-resolution color monitor.

The MX-4190 is said to offer 1,600- by 1,280-pixel displayable resolution at 0.25mm pitch. The 19-in. red-green-blue monitor reportedly features 60-Hz noninterlaced refresh rates for flicker-free image display. According to the vendor, applications for the MX-4190 monitor include computer graphics, computer-aided design and manufacturing as well as animation and simulation.

The MX-4190 monitor is priced at $5,995 and up.

Monitronix, 2971 Silver Drive, Columbus, Ohio 43224.

Printers/Plotters

Versatec, Inc. recently introduced **Versacolor**, a thermal transfer color plotter.

Versacolor reportedly provides color output in 8½- by 11-in. and 11- by 17-in. sizes. Media support includes cut-sheet opaque paper and polyester film transparencies. Versacolor can be used as a hard copy device with Versatec's Model 250 red-green-blue video controller, which captures data directly from a CRT.

The plotter is priced at $8,950.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

■

Genicom Corp. has announced the **QMS bar code** options package for use with the company's Model 4410 and 4440 line printers.

Features of the QMS package include oversize characters, bar code rotation, reverse image, line and box drawings, halftones, different character styles and pitches and letter-quality characters. The Model 4440 prints at 800 line/min and the Model 4410 prints at 400 line/min. Both printers are said to offer several modes of printing, including near-letter-quality, data processing and draft.

The QMS bar code option costs $1,995.

Genicom, 1 General Electric Drive, Waynesboro, Va. 22980.

Power supplies

Power Mouse, a remote power control unit for computer systems, has been introduced by **Networx Co.**

Power Mouse reportedly offers protection against voltage surges, electromagnetic interference, radio frequency interference and static. In addition, Power Mouse offers complete modem and telephone line protection from surges and spikes, the vendor stated.

It is said to give computer users the ability to power up an entire system, or up to five separate components or peripherals, with a single master switch. The units can also be controlled individually with switches on the controller.

Power Mouse is priced at $199.95.

Networx, 203 Harrison Place, Brooklyn, N.Y. 11237.

Auxiliary equipment

Datem Ltd. has introduced its Intel Corp. Bitbus-compatible **DDCM110** LCD data terminal module, said to offer support for a wide selection of peripheral interfaces.

The module is made up of the following individual systems: an LCD display driver interface and associated firmware; a membrane and capacitive keyboard interface said to support up to 128 keys; an asynchronous serial channel supporting full-duplex operation for 50 to 38,400 bit/sec. that has firmware-controlled 128-byte, first-in first-out buffers for transmit and receive channels; and digital I/O ports.

The DDCM110 costs $625.

Datem, 148 Colonnade Road, Nepean, Ont. Canada K2E-7R4.

PRICE REDUCTIONS

Zaki Corp. has reduced the price of **PC Share/R** and **PC Share**.

PC/Share reportedly enables one personal computer to be used by two users at the same time. With PC Share, both users can work on the same program or on two entirely different programs.

PC Share/R was designed to be used with color graphics boards and PCs with built-in graphic adapters, such as Compaq Computer Corp.'s Compaq and AT&T's PC 6300. PC Share/R now costs $499; PC Share now costs $599.

Zaki, Maple Technology Park, 420 Maple St., Marlboro, Mass. 01752.

■

Quixote Corp. has reduced the price of **Rapidwriter**.

Rapidwriter is a text and data entry system that combines software and a keyboard to allow personal computer users to enter frequently used words, phrases and paragraphs with a single keystroke. Rapidwriter works with the IBM Personal Computer or Personal Computer XT with at least a 256K-byte random-access memory.

Rapidwriter now costs $395.

Quixote, One E. Wacker, Chicago, Ill. 60601.

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COMPUTER INDUSTRY

Section begins on page 114

Battling Big Blue: How competitors win sales from IBM

Perseverance, product delivery keys to success

By Ninamary Buba Maginnis

Before the U.S. Air Force last January awarded Lowell, Mass.-based Wang Laboratories, Inc. a $480 million contract for 1,600 minicomputers, the competition narrowed to two vendors: Wang and IBM. The Air Force judged systems on cost, technology, user friendliness and the ability to service large procurements. "We came out ahead," says Robert L. Doretti, Wang's senior vice-president of U.S. operations.

The five-year contract took almost as many years to win. "And that wasn't done just through our sales rep," the sales vice-president explains. A team of Wang specialists consulted, developed applications and installed test systems to operate applications over a given time frame.

Wang's success in securing the Air Force award appears to be part of a trend. Perseverance, coupled with a deliverable product, may be the secret ingredient to winning a sale against IBM, according to competitors. For many years Big Blue has enjoyed the forefront, leaving even No. 2 vendor, $6 billion Digital Equipment Corp., in the dust when compared with the $60 billion IBM.

As IBM busies itself with realigning its networking strategy, other vendors seem to be making more headway in heretofore IBM-only accounts. Staying power that stems from having some success in technology has paid off, giving an edge to such vendors as Maynard, Mass.-based DEC, Wang and Apollo Computer, Inc. of Chelmsford, Mass.

DEC is big winner

But DEC is the big winner, according to industry analyst George Colony, president of Forrester Research, Inc. of Cambridge, Mass. "I don't think, aside from Digital, that other vendors have that much luck against IBM in IBM-traditional markets," Colony says. The minicomputer vendor's compatible mid-range systems compete well against IBM's mid-range offerings.

Wang and Apollo, on the other hand, succeeded because their initial markets were non-IBM ones. "Wang avoided IBM in the mid-'70s with word processing — which IBM did not have," Colony notes. "That's the major reason Wang succeeded."

As for Apollo's pioneering the engineering and scientific workstation market, the computer giant played the same old game. "IBM is easy to understand," Colony observes. "They create products when they believe there is a customer requirement for that product, i.e., customers are already buying equipment from other vendors to fill their needs before IBM even considers making systems for that market."

Often, competitors say, IBM sales representatives sell a total solution based on some product offerings that are still on the design table.

"There is some disbelief," says David Korf, DEC's multivendor networking marketing manager, referring to customers' reactions when DEC sales representatives explain networking products. "IBM has said for a long time that things can't be done this way. And in the IBM world, they can't right now. Somewhere in the sales cycle, our sales reps have to jump through the IBM loop and prove what Digital is claiming. We can prove it today — our networking is alive, working and viable."

IBM's Systems Network Architecture describes hardware and software that is still under development, Korf says. "It's very, very difficult to distinguish what products are available today and what's future. Digital shows customers products that have been shipping for a number of years — not something we've just developed. We offer reality."

Apollo, founded in 1980, captured a large share of initial business before other vendors joined the marketplace. Although IBM officially entered the scientific and engineering workstation market earlier this year with s low-end product, the giant has always been a competitor for the workstation company.

Workstation concept vs. IBM terminal

"Our first sale and subsequent sales weren't directly against an IBM workstation but resulted from our people selling the concept of a workstation vs. an IBM terminal," says Angelo Guadagno, Apollo's vice-president of North American sales operations.

Analyst Colony notes, "One way to compete against IBM is to move to the market quickly. IBM is certain to wait until the market develops before making an offering." One anomaly to that wait-and-see theory is IBM's booming success with the Personal Computer, he says, claiming IBM was fortunate to introduce personal computing when the market was ready for it.

Apollo's workstations offer more than a personal computing environment with dedicated, high-speed processing power, graphics and networking. The technical requirements are what the workstation vendor stresses in its Big Blue battle.

"If you're going to compete against IBM you really don't want to be a me-too," Guadagno notes, explaining that IBM would essentially take over the account, if Apollo attempts that strategy. Apollo combats IBM sales representatives' warm blanket — an intangible mix of solutions, service, consultation and projected computing needs — with hard facts and details, Guadagno claims.

"We try to move the customer from this amorphous or general security blanket to something specific, something that the manager or decision maker can really understand," according to Guadagno, who worked 15 years at DEC, most recently as regional sales manager for the Northeast, before joining Apollo 18 months ago. "When we get it down to that level, we find IBM is at a loss to actually deliver, because now the concept that they are pushing causes them a problem with what their deliverables really are — and what their deliverables really do for the customer."

One vendor's successful strategy is not always right for another. Wang, for example, is well adapted to consultative selling, Doretti says. Forrester's Colony agrees. "The Wang sales force is oriented to the office market, and Wang understands the office market better than IBM," he says, stating that Wang's products are friendlier and easier to expand than the computer giant's wares.

Wang sales representatives are aware that first impressions can sometimes be lasting ones. Often, the first vendor to approach a customer can influence the sale in his favor by helping to shape the way the customer views solutions, Doretti explains.

In all, Wang representatives work their sales the same way, whether IBM is a contender or not. Basic ingredients to any successful sale include having a good understanding of the competition — from product offerings to the installed base to how the proffered solution integrates with an existing solution. "Where IBM is heavily entrenched in an account, of course, it makes your sales effort more of an upward battle if you don't have relations within the MIS arena," Doretti says.

Apollo's sales representatives have an average of 10 years' industry experience, which accounts for the workstation vendor's savvy when IBM is in the competitive arena. "Selling against IBM is something our salesmen have as part of their own experience," Apollo's Guadagno notes. "They've lost a lot and are experienced enough to figure out where they really have an edge."

Transferring data base is costly

Being better does not always guarantee a sale. While Apollo has been successful in its market, some potential customers admit the workstation vendor has a better product, but the price to transfer data base information from an existing IBM mainframe to another system is cost-prohibitive, Guadagno says.

"A lot of large aircraft companies have design data about the mechanical structures of their aircraft in large data bases on IBM mainframes," he explains. "The data base has to be converted to a different format to get off of IBM to either DEC or Apollo — or anybody."

But there is hope. More generic, portable languages such as C, Pascal and Unix are helping to make customers more hardware-independent, Guadagno says.

As the computer industry migrates toward standards, non-IBM vendors with proven networking products seem to have an edge. "An analyst is saying users have to make a decision," DEC's Korf says. "Can they wait to meet their needs, or are their needs pressing enough to want a solution now — and go to DEC" or any other vendor that fits their needs?

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Semiconductor group sees industry upturn

Cites increased demand for electronics products

By Rhosmary Bube Maghasis

SANTA CLARA, Calif. — Expected growth in the electronic equipment market points to a reasonable spurt in the semiconductor industry during the next two years with a slowdown in 1989, according to a forecast compiled by World Semiconductor Trade Statistics, Inc. (WSTS).

The prediction marks a turning point for the semiconductor industry, which saw a moderate increase in 1986 after a big slump in 1985.

The forecast, announced early last week at the Semiconductor Industry Association's (SIA) annual dinner, predicts a 20% increase in semiconductor business worldwide, amounting to $26.6 billion. WSTS anticipates a 23% growth in 1988, or $31.9 billion, and expects only 8.9%, or $42.4 billion, in 1989.

While the general prediction is accurate, WSTS' numbers are somewhat bloated, according to industry analysts. "The SIA called the trends right, but not the numbers," said semiconductor analyst Andrew Rappaport, president of The Technology Research Group of Boston. More conservative estimates predict $28 billion in 1987 and approximately $42 billion in 1990, he said.

"Ultimately, growth is dependent on consumption," Rappaport said. "The higher the electronic content of all kinds of products, the higher the consumption of semiconductors. The funny thing about the semiconductor market is it's very inventory sensitive. The computer industry hit bottom and is turning around; the communications industry is doing OK. Most of the major industries consuming semiconductors have hit the bottom of the slide and are turning around."

Industry analyst Howard Bogert is not as optimistic. The semiconductor industry may see a negative growth rate in 1989 with only a 12% to 19% increase in 1987, according to Bogert, vice-president of the semiconductor industry group at Dataquest, Inc. of San Jose, Calif. Bogert's 1988 predictions are in line with the WSTS report.

"We have lowered our long-term growth rate in the electronics industry by a third, which is very, very significant for the U.S. electronics industry," Bogert said. He added that the most growth will be seen in Japan, South Korea, Tawain and other Asian countries.

> ***'The higher the electronic content of all kinds of products, the higher the consumption of semiconductors.'***
>
> — Andrew Rappaport
> The Technology Research Group

During the semiconductor industry's slump of 1985, inventories were high, analyst Rappaport said. Now that inventory levels are dropping and the demand for electronic products is increasing, new semiconductor orders will rise, Rappaport continued.

The WSTS forecast is based on information compiled from 42 participating semiconductor manufacturers in the U.S., Europe and Japan.

The forecast comes at the end of what first appeared to be a good year for the semiconductor industry. In Japan, for example, sales appeared to increase. But, in fact, unit consumption did not grow. "Most of the increase in the industry is due to the [increased] value of the yen," Rappaport said.

Jonathan E. Cornell, senior vice-president and sector executive of Harris Corp.'s semiconductor sector, cautioned SIA members about 1986 semiconductor sales.

"What appeared to be significant and dramatic increases in Europe and Japan become essentially zero growth after adjustment of these numbers for the exchange rates," said Cornell, who is on the SIA's board of directors.

After exchange rates were calculated into growth figures, the 1986 figures come in at a moderate 6.5% increase, according to Cornell.

The SIA attributes its 1989 slowdown prediction to a decline in worldwide economy as the decade closes. "This industry does have peaks and valleys — interesting curves," SIA representative Ione Ishii said. "There are a number of years of growth followed by a slight decline."

In 1985, when the semiconductor industry was severely wounded, the worldwide economy also had a poor showing, Ishii explained.

CMOS technology will represent half the market by 1989, claiming market share from both NMOS and PMOS technologies, according to the WSTS study. Bipolar technology will continue to hold a 10% claim, the study said.

The WSTS report shows a shift away from the U.S. and into Japan and the rest of the world. After currency exchange adjustments, however, the shift appears less dramatic, with much business shifting from the U.S. into other Pacific Rim markets outside Japan.

WSTS is sponsored by the SIA, the European Electronic Components Association and the Electronic Industries Association of Japan, representing U.S.-, Europe- and Japan-based semiconductor manufacturers, respectively.

The WSTS committee, a representative group of WSTS-participating companies, meets twice yearly to produce industry forecasts.

Software International targets DEC mart

Buys software group, creates business unit

ANDOVER, Mass. — Software International Corp. today is expected to announce a number of moves intended to strengthen its sales to the Digital Equipment Corp. market, which a company official says is growing at 35% a year. The actions include the following:

- Acquisition of a financial software segment of Lowell, Mass.-based Interactive Systems, Inc.
- Creation of a business unit dedicated to the DEC marketplace.
- An increase in research and development of DEC-compatible products.

Software International introduced its Masterpiece Series VAX family of on-line accounting and business management applications software products in May. The products run on all VAX systems, from the the Microvax II through the VAX 8600.

The company's sales of financial software products for DEC computers are running about twice the rate of 1986 sales, according to Software International.

Ownership transfer

The deal with DEC software supplier Interactive Systems, the manufacturer of Scope and Mentor program products, transfers ownership of the Interactive programs to Software International. The programs in the deal form part of general ledger, accounts payable, accounts receivable, fixed assets and payroll application software packages.

Combined with software programs from Software International, these programs make up the Masterpiece Series VAX software that is currently marketed by Software International.

In addition to the program code, the acquisition provides Software International with product documentation, exclusive marketing rights, all existing customer contracts as well as a team of staff members from Interactive.

The acquisition provides DEC customers with a single source for development and support, according to Jeffrey S. Goodman, president of Software International. This opens up a target market the company estimates at more than 100 customers, many of them multiple-product users.

The creation of a separate DEC business organization responsible for product marketing, development, support, sales assistance and consulting is intended to make Software International one of the largest providers of financial applications software to DEC system users, said Regis Kaufman, general manager of the new unit.

Finally, to support the newly created organization, Software International plans major investments in product development, documentation, customer support, product education and training, sales and marketing.

NTT predicts flat U.S. telecom purchases

Vendors say standards, cultural differences cause trade hurdles

By Alan Alper

NEW YORK — Despite making extensive efforts to promote trade with foreign companies, officials of Nippon Telegraph & Telephone Corp. (NTT) last week said they expect little increase in NTT's purchases of U.S.-made telecommunications gear in the near term.

Speaking to a small group of reporters in New York, the contingent, led by Takashi Kato, director general of NTT's international procurement office, indicated that while the firm has opened its doors to foreign-made goods, few U.S. firms are actively seeking its business.

NTT, which was transformed from a government-owned Japanese business to a publicly held concern last year, asked U.S. vendors to bid on 191 equipment items last year, Kato said. NTT received responses for only 22 items, he added.

"Imports from the U.S. will not increase very much because we're not receiving as many bids as we expected," Kato said.

In fiscal year 1986, NTT imported $200 million worth of goods, including telecommunications gear, from U.S. firms. That figure represented about 6% of NTT's total procurements, Kato noted.

U.S. vendors have in the past criticized NTT's procurement policy, citing its strict adherence to Japanese standards of quality and reliability as well as conformance to domestic communications standards. NTT has also asked for bids on small-volume business — orders many U.S. vendors claim they cannot fill cost-effectively.

Kato said NTT's quality standards, which are set by the Japanese government, were recently changed to resemble U.S. Federal Communications Commission standards. Regarding communications protocols, NTT products adhere to CCITT international standards, noted Tetsuro Yamazoe, director of the international procurement office.

> *'NTT will . . . buy nothing from the U.S. but broomsticks.'*
>
> — Fritz Ringling, Gartner Group, Inc.

While some foreign companies such as Motorola, Inc. and Northern Telecom, Inc. have won $30 million and $240 million contracts to supply pagers and digital switching systems, respectively, analysts say those two firms are exceptions to the rule.

Foreign companies still face the same obstacles in doing business in Japan, said Fritz Ringling, an analyst with the Gartner Group, Inc. of Stamford, Conn. These include distribution channels that rely heavily on Japanese trading companies as primary sources of supply as well as the ever-present cultural differences.

"NTT will not buy a hell of a lot from U.S. companies over the next four or five years. They will continue to buy from the people they are comfortable with: Hitachi, NEC, Toshiba, Fujitsu and Oki," he said.

"Nothing will change," Ringling continued. "NTT will continue to use the same old arguments that U.S. products are too expensive and not adjusted to the Japanese market and buy nothing from the U.S. but broomsticks."

Ringling noted that even the contracts foreign companies have signed with NTT have not begun to pay off yet. "They signed a contract with Northern Telecom, but that was only an intent to buy," he said. "It took Motorola 10 years to sell something like 100,000 pagers."

Ringling agreed that U.S. firms have not done a good job attempting to circumvent the barriers. "The fact that their applications are in English and a consultant is needed to interpret them has not helped many companies either," he noted.

According to Kato, U.S. vendors would stand a better chance of doing business with NTT by starting joint ventures with Japanese companies. It would help them avoid cultural, environmental and market-driven problems, he said.

Geisco names president, changes focus to teleprocessing networks

ROCKVILLE, Md. — Anthony Craig will this week become the new president of General Electric Information Services Co. (Geisco), completing the company's repositioning.

Craig, who was also elected a vice-president of General Electric Co. in Fairfield, Conn., succeeds Walter Williams, who has been promoted to senior vice-president of corporate marketing and sales at GE.

Geisco's Craig

GE also announced that Geisco will report to GE's new communications and services organization, which will be headed by Eugene Murphy.

Murphy takes the new position of senior vice-president. He was formerly executive vice-president at RCA Communications and Electronic Services, another GE subsidiary.

Repositioning complete

"GE Information Services has completed its repositioning of the business and is now the world's premier provider of advanced teleprocessing and network-based services," Craig said.

"The strengths of our worldwide presence and teleprocessing network are used to provide large, complex network-based applications and systems integration to serve clients in international banking, international trade and electronic data interchange," he continued.

Craig joined Geisco in 1983 after serving 17 years with IBM, primarily fulfilling sales and marketing positions.

"I am confident that Tony's years of experience with GE Information Services and the industry, plus his focus on client support and sales, will match well with needs of the business and the fine team he will be leading," said GE Vice-Chairman and Executive Officer Lawrence Bossidy.

In addition to banking and electronic data interchange, Geisco provides network-based services for the manufacturing, shipping, retail, teleprocessing and health care industries.

Network reaches 750 cities

The information services firm's very large teleprocessing network reaches 750 cities directly in more than 30 countries.

In addition to Geisco, the new communications and services group will consist of eight other organizations.

Those firms include Software International Corp. and GE Consulting Services Corp.

MERGERS AND ACQUISITIONS

Comdisco Disaster Recovery Services, Inc. announced the acquisition of a building complex in St. Louis for the development of a South Central Recovery Center. The facility will be developed in three phases as part of the Chicago-based disaster recovery vendor's hot-site expansion program for the South Central U.S.

Phase I will provide three cold sites, or shells consisting of conditioned recovery space and support areas. Phase II will provide hardware and communications access to other recovery centers in Comdisco Disaster Recovery's network via Comdisco's Hot Site Extension capability.

Phase III of the facility's development will feature the addition of a fully configured IBM hot site featuring an IBM processor as well as a full complement of state-of-the-art peripherals and communications capabilities. The facility will provide one hot site, two shells and supporting office areas.

■

Greyhound Corp. announced that a definitive agreement has been reached with **Bell Atlantic Corp.** of Philadelphia for the sale of **Greyhound Capital Corp.**

Details of the sale, including purchase price, were not disclosed. The closing is expected to take place prior to Oct. 31.

We've extended

IBM System/38

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So it's easier to expand your systems as your business needs grow. And to find IBM solutions for your business problems.

A Powerful Family Performance

For starters, the most powerful of three new IBM System/36 models has internal performance approximately 50 percent faster than was previously available. It has 3-1/2 times more memory capacity, which can mean significantly improved performance for your data processing and departmental office environments.

There are six new models of the IBM System/38 with a lower low end and a higher high end. The smallest system has internal performance approximately 30 percent faster than its predecessor —and costs 30 percent less. The biggest has twice the internal memory of earlier models.

As your business grows, so can your systems. You can now go from two to 72 locally attached workstations with the IBM System/36 and up to 256 with the System/38.

Family Technology

Advanced IBM technology is included in models of the System/36 and System/38. For instance, IBM's one-million-bit memory chips and two new

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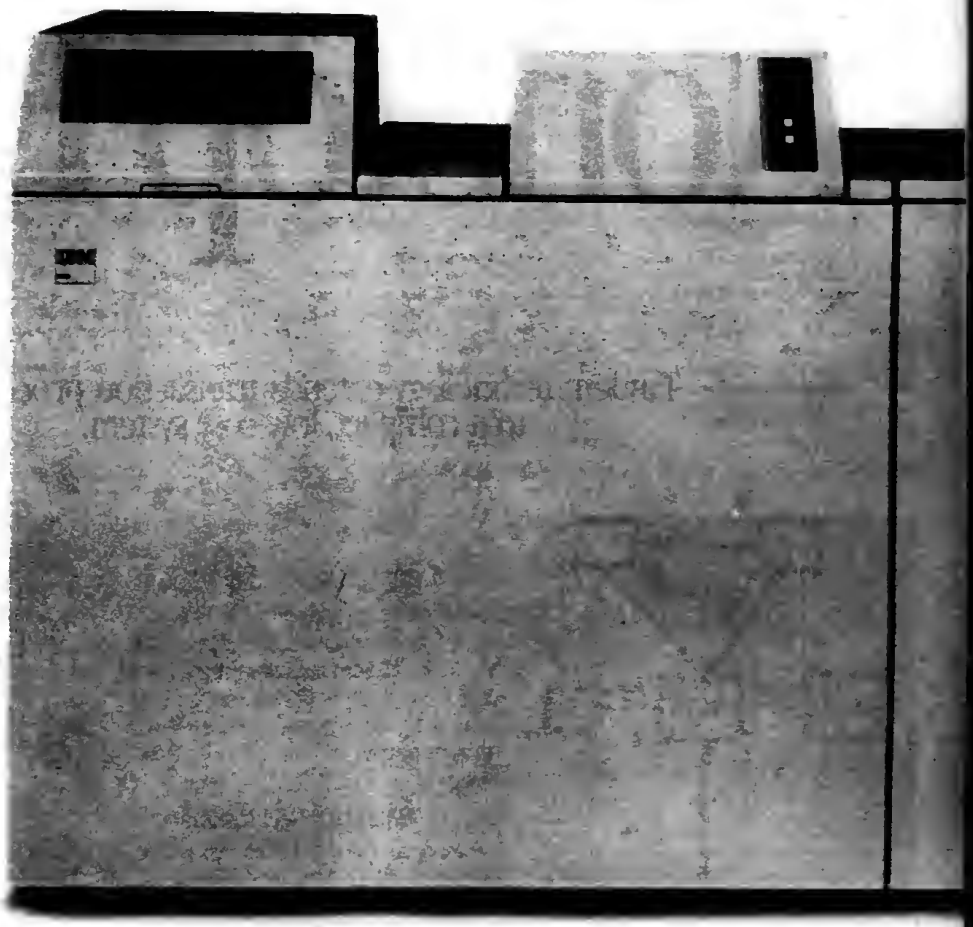

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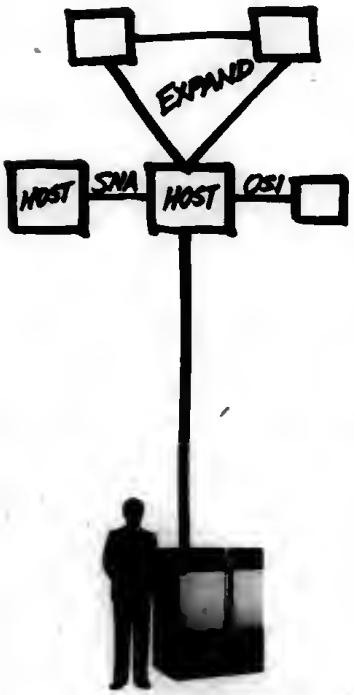

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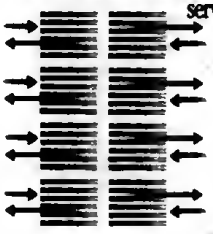

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EXECUTIVE CORNER

Isdos, Inc. has changed its name to Meta Systems Ltd. and announced that **Richard J. Welke** has been appointed president and chief executive officer of the company.

■

Robert Williamson has been elected president and chief executive officer of United Software Industries, Inc. Williamson, one of United's cofounders, has been involved in marketing and product development within the computer industry for more than five years.

■

Microspeed, Inc. has announced a reorganization of its top management. **John K. Martinelli**, one of the company's cofounders, will serve as chairman and director of engineering.

Timothy C. Barry, also a cofounder, will act as president and chief executive officer. He will also retain his position as director of sales and marketing. Cofounder **Steven H. Hare** will remain vice-president and director of operations.

■

Joseph A. Saponaro has been elected president of Intermetrics, Inc. He has been with the company for 17 years, serving the past two years as executive vice-president and chief operating officer.

John E. Miller, who has been president since the company was founded in 1969, has been elected chairman.

■

Dataproducts Corp. announced the retirement of Cofounder and President **Graham Tyson**. Tyson joined Dataproducts at its founding in 1962 and has served as vice-president, president, chief executive officer and chairman of the board.

He was succeeded as CEO and chairman of the board by **Jack C. Davis**. Davis will now also assume the title of president. Tyson will remain as a member of the board of directors.

■

Counterpoint Computers, Inc., maker of multiuser computer systems, has announced the appointment of **Douglas Thistlethwaite** as vice-president of operations. Thistlethwaite comes to Counterpoint from Parallel Computers, Inc. in Santa Cruz, Calif., where he was vice-president of operations for three years.

■

Tylan Corp. has announced a management reorganization, including the appointment of **Kenneth Cleveland** as president and chief executive officer to succeed **Charles F. Drexel**, who will continue as chairman of the board. Cleveland, 53, is president and founder of Kenneth Cleveland Associates, Inc., corporate turnaround specialists.

■

Personal CAD Systems, Inc., manufacturer of personal computer-based electronic design automation software, has appointed **Douglas Stone** as president and chief executive officer.

Founder **Richard Nedbal**, who previously held the positions of president and CEO, will continue as chairman of the board.

■

Robert Williamson has been elected president and chief executive officer of United Software Industries, Inc. Williamson, one of United's cofounders, has been involved in marketing and product development within the computer industry for more than 5 years.

John Baerthlein has been appointed president of Sterling Software, Inc.'s Systems Software Marketing Division in Rancho Cordova, Calif. Baerthlein was formerly vice-president of international sales at Policy Management Systems Corp. in Columbia, S.C.

■

Erwin A Kelen, president and chief executive officer of Datamyte Corp. in Minnetonka, Minn., has been elected chairman of the American Electronics Association for 1987.

■

Microsoft Corp. announced the appointment of **Scott Oki** as senior vice-president of U.S. sales and marketing reporting to company President **Jon Shirley**. Oki, who previously served as vice-president of international operations, will assume his new position immediately.

Gould shifts gears; Ylvisaker resigns

From page 114

electronics or those areas that are more closely related to it.

CW: How does the computer and electronics business today differ from 20 years ago? How do these differences relate to running a company?
YLVISAKER: If you look at major businesses, there's more of a worldwide economy today than there was 20 years ago, when there was a very nationalistic economy.

Today, you have to adapt to that and be prepared to compete with companies from abroad.

CW: What industry changes do you anticipate in the forthcoming years?
YLVISAKER: I think the worldwide economy will definitely present some problems for many U.S. companies, particularly those that don't adapt rapidly to the changes taking place in today's marketplace.

It will present a real opportunity for those who can make the changes since those who don't won't be in business anymore.

Amdahl gets it right with 5890

From page 114

its original performance was 30% lower than announced and its reliability was poor. "It probably took us two years to fully recover from those early mistakes," admitted Jack Lewis, Amdahl's chief executive officer. The company is trying to prove it has learned from its past mistakes and to regain some of the credibility it lost the last time around.

What Francesconi did not refer to, however, was the second part of my answer to White in late 1982 when he asked me about Amdahl's image in the marketplace. Having indeed said that, prior to the 580 announcement, I thought Amdahl enjoyed an image of "quiet competence," I added that my opinion changed after the announcement.

You see, Amdahl announced the 5880, its first multiprocessor, in November 1980 with a two-year lead time. "That was a bit of grandstanding," I remarked. Straightening himself up abruptly in his chair, White replied, "It was a signal that the company was committed to multiprocessing and knew how to handle it."

Committed to multiprocessing, perhaps — but how did the company demonstrate that "it knew how to handle it"? The 5880 was more than two years late, even after the original two-year lead time had expired. It was first shipped in April 1985, possibly setting a world record for late product delivery.

At this year's August meeting for financial analysts, Amdahl's chairman finally acknowledged the harm that this 1980 move may have caused Amdahl's business. "It is fair to say that in the last few years we've lost market share, largely due to our inability to ship the 580 multiprocessor on time," White said.

Given such a track record and the fact that Amdahl's first 5890 is a dual processor, one naturally wonders whether the company means business this time.

Having closely monitored the developments at Amdahl (through seven visits in the last six months, among other means), I can offer the opinion that yes, Amdahl is for real this time.

What has made the difference for Amdahl this time is its focus on quality. First, the company developed and implemented much better testing procedures. Second, given the complexities of today's large mainframes, Amdahl realized that the machines are bound to fail sometimes no matter how much emphasis management places on quality or product testing.

It focused accordingly on recovery, to minimize the impact on the user. Third, Amdahl focused on developing better communications among its engineering, development and marketing teams. Last but not least, the top management team got its hands dirty this time by staying closely in tune with the development process.

These four reasons for the 5890's early successes are a result of Amdahl's determination to learn from its past mistakes. "The company has matured in the last few years," Eugene White suggested. I agree.

SUPERSHORTS

National Semiconductor Corp. announced that it plans to shut down its semiconductor plants in the U.S. and Europe for a total of 14 days during the remainder of this year. The shutdown is because of continued deterioration of semiconductor sales and orders.

■

Intelogic Trace, Inc. and **Televideo Systems, Inc.** of Sunnyvale, Calif., announced that they have signed a third-party service agreement for both warranty and after-warranty service on Televideo's computer systems and terminal products.

■

Digital Equipment Corp., the world's leading manufacturer of networked computer systems, and **Ericsson Information Systems AB**, the Swedish information systems supplier, announced a worldwide cooperation agreement.

The pact is aimed at increasing the two companies' combined share of the high-growth banking information systems market in Europe and the U.S.

The agreement will cover a complementary supply relationship based on DEC's strength in distributed computer solutions and Ericsson's leadership in terminals and front office equipment. DEC and Ericsson will integrate DEC VAX computer systems and the Ericsson family of banking products into a common system for the retail banking market.

A joint research and development facility to support the integration of products and software required for the markets covered by the agreement will be established in Sweden.

■

IPL Systems, Inc. has returned its production and administrative staff to a five-day workweek effective today. These employees had been on a four-day workweek since July 7, due, in part, to longer-than-anticipated delays in obtaining additional orders for IPL 4460 computers from its single domestic OEM customer and, in part, to the cancellation of a contract to sell computers in China, the company said.

The Waltham, Mass.-based IPL said the return to a five-day workweek was made necessary by the introduction of add-in memory products for the IBM System/38.

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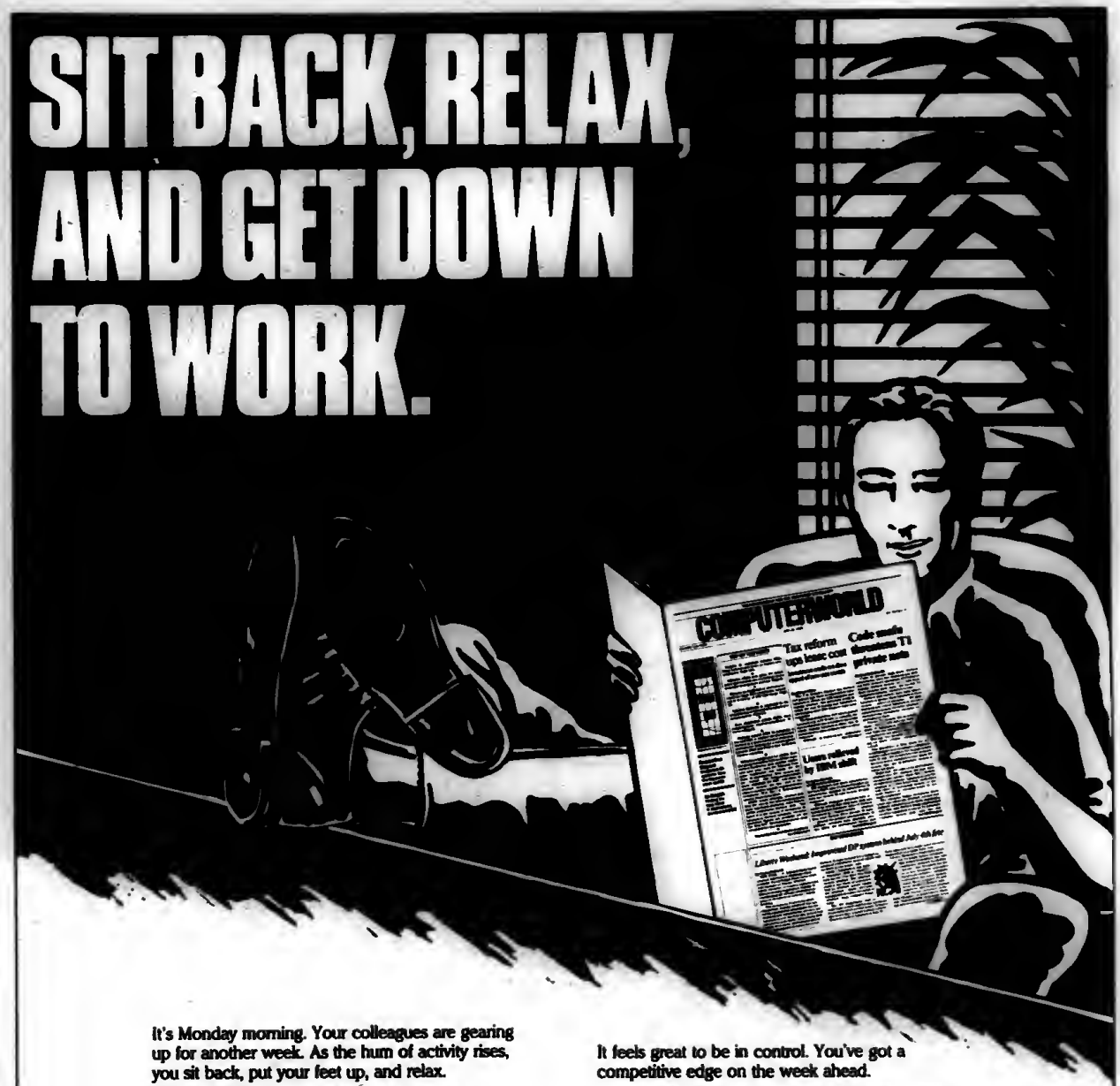

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We are looking for Programmer with at least two years experience coding in RPG III. Job involves new systems de-velopment and existing systems main-tenance from project definition through final testing. Both full time and part time hours are available. Work schedules can be designed to meet your needs. We provide a competitive salary and benefits package as well as career growth. If you're looking for an oppor-tunity with a future call (203) 536-4291 or send resume to Mystic Color Lab, Post Office Box 144, Masons Island Road, Mystic, CT 06355, Attn: Per-sonnel. Principals only

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Applicant's academic background must include advanced degree preferably with experience in computer applications in an academic discipline. Work background must include at least five years of progressive management experience preferably including experience in providing academic computing service.

Salary is negotiable and competitive. Submit letter of application, current resume and salary requirements to:

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For immediate consideration and management interview, please send your resume to Sperry Corporation, Worldwide Technical and Project Staffing, 3001 Metro Drive, Suite 300, Bloomington, MN 55420, Attn: Rodney Smith, or call (612) 851-3109. An Equal Opportunity Employer M/F/H/V.

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- Oct 27 - **Decision Support Systems**
- Nov 3 - **1000th ISSUE**
- Nov 17 - **Systems Integrators**
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The Deputy Director serves as principle advisor/assistant to the Agency Director in planning and managing the activities of the Department. Major duties include: providing guidance and assistance to Division Directors; legislative activities; interaction with local, state and federal officials; day-to-day operational management support; and special projects as assigned by the Agency Director. Must have extensive knowledge and experience in the management of complex organizational units, data processing, telecommunications, general administration, and service type operations. Exceptional interpersonal and communications skills are essential.

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Commonwealth of Virginia
Department of Information Technology
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EOE/M-F

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Program trading hits Wall Street

From page 1

"The drop would have occurred regardless of program trading," he continues, citing the basic fundamental factors theory. "It just would have taken longer for the pure reaction to be seen."

During the last two years, Wall Street's largest securities firms and institutional investors have implemented sophisticated programs to ascertain the optimal time to buy or sell a group of stocks.

In its purest form, program trading enables money managers to simultaneously buy or sell a basket of stocks to minimize exposure or to capitalize on potential value increases.

Program trading is also used by risk arbitrageurs or short-term players looking to sell before stocks begin to sink and buy before they rise. These players use programs that assess discrepancies between stock indexes, such as the Standard & Poor's 500, and futures contracts based on those indexes. Once a preset differential is reached, the program commands a trader to either buy index future contracts and sell the stocks within the index or vice versa, depending on which direction each is heading.

While some of these programs are developed in-house, others are designed by software consultants and allegedly use proprietary algorithms. The programs run on microcomputers through mainframe systems and plug in raw market data supplied by stock quote firms like Quotron Systems, Inc., Automatic Data Processing, Inc. (ADP) or Wang Laboratories, Inc.

So far, it would appear that Wall Street's MIS/DP departments have played a limited role in creating the decision support mechanisms around which program trading revolves.

"Our main job is to get the information into the traders' PCs. They do with it what they want," says an assistant vice-president of data processing at a large Wall Street firm who requested anonymity. "We only get involved if someone says they want to look at a batch of securities at once, but that's pretty simplistic."

In fact, much of program trading is not very automated at all.

"It's a lot less complicated than you would think," suggests Marshall Caro, chairman of New York consultancy Programit. "Most program traders get their prices from Quotroo or ADP/Bunker Ramo quote systems and have a clerk manually input the data into PCs or terminals.

"There's a lot of hoopla about all these proprietary algorithms," he continues, "but in actuality, very little of it is used."

MIS/DP, however, will get more involved once firms partaking in program trading set up real-time pricing mechanisms accessed by programs that measure stock and index relationships.

"That's where it becomes more complex," he declares.

One problem, the anonymous DP executive points out, is MIS/DP's fear of violating contracts with the stock quote suppliers. "We won't do anything unless we get a clear sense from the vendor that we can do it in a clean fashion," he says.

Many vendors, such as Bridge Trading Co., are supplying historical data that traders use to form their decisions, which could conflict with in-house efforts, he adds.

Speed and accuracy of the data is the essential element of program trading, Wall Street sages say. "If there's some delay and you zig when you should have zagged, it could be an expensive exercise," suggests Scott Hamilton, vice-presideot and supervising coordinator for equity program trading at the First Boston Corp. in New York.

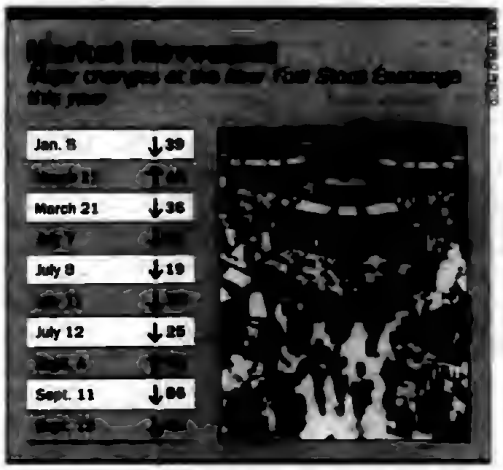
Yet, some observers equate the use of program trading in the financial markets with half-baked formulas used by horse racing connoisseurs.

"It's like a bunch of sophisticated gamblers; they put all their facts and figures into their computers and watch the big board as if it's a betting board," notes one savvy market observer who requested anonymity.

On Sept. 11, when the Dow dropped 86.6 points, the largest single daily decline in its history, arbitrageurs were using their computer programs to compare futures options of stocks that make up the Standard & Poor 500 with the underlying cash prices of the stocks, Vanderbilt's Stoll explains. "What they reacted to was the decline of futures, and many sold their holdings."

While huge paper losses were piled up because of the decline, few Wall Street people are worried about the program trading's impact on the market. The Dow's 86.6-point drop Sept. 11 equated to only 4.6% of the blue-chip stock value, observers point out. When the stock market crashed in 1929, its value plunged more than 12%, experts add.

"I think program trading has a minimal impact over a long period of time," notes Jon Groveman, head of equity trading at Ladenburg, Thalman & Co. in New York. "It probably impacts some daily trading activity, but it is of little significance in the overall scheme of things."



Yet, some view the incidental volatility as a disturbance. "To long-term investors, it's nothing more than an annoyance than anything else," says Henry Gailliot, senior vice-president of Federated Research Corp., a Pittsburgh money management firm that, because of its investment horizon perspective, refrains from program trading.

Many players claim that because of the huge amounts of capital required to support the simultaneous purchase of baskets of stocks, program trading could limit the participation of smaller investment firms and small-time investors.

"To do this, you need a large operation with deep fioancial and technical resources," explains First Boston's Hamilton. "Most of the arbitrages are not riskless."

Program trading's greatest impact is felt during the so-called "triple witching hour," the Friday each quarter when stock options, index options and futures on index options expire. This usually causes voluminous trading in the market's final hour as arbitrageurs and money managers reposition their investments.

"Program trading is something that's here to stay," adds Byron Wien, an investment strategist at Morgan Stanley & Co. in New York. "It's a totally new phenomenon that is with us all the time but four times a year reaches a crescendo."

While the most recent triple witching hour passed Sept. 19 with little notice — the Dow Jones average did, however, shed 11.53 points — the market in the past has reacted with a resounding thump.

On March 21, the first triple witching hour of the year, the Dow fell almost 30 points in the last 60 minutes of trading. Sell orders for more than 46 million shares were received by the New York Stock Exchange in the last minutes before the session's close.

The SEC recently widened its probe to include the use of program trading. "We have been monitoring the index products since they have been put in place and have been working closely with the exchanges looking at program trading," notes Dennis Shea, assistant director of market regulation at the SEC. "For the most part, we have no trouble with program trading with the exception of what happens around the triple witching hour."

Shea concedes that the SEC is assessing a variety of options, such as limiting the number of options an investor can hold at one time, to mitigate the increased volatility caused by program trading.

In an attempt to curb the sharp price swings, the SEC recently asked members of the New York Stock Exchange to place buy or sell orders by 3:30 p.m. for stocks that make up the Dow average on triple witching Fridays. To some, the SEC recommendation was like closing the barn door after the horses got out.

"It's like the President Ford 'WIN' buttons that said 'Whip Inflation Now,'" says Morgan Stanley's Wien. "By the time they were printed, they were no longer needed."

Honeywell to restructure

From page 114

woman Kathy H. Tunheim said. "The product lines of Honeywell and Bull have a lot in common, and Honeywell and NEC have even more in common, particularly at the high end. There is an enormous customer base among these three, and these are tremendous opportunities to better serve those customers."

But while Tunheim emphasized that the restructuring is intended to strengthen Honeywell's computer business, the company's formal statement also noted that Honeywell "will continue to focus on its core businesses," including controls and automation for buildings, industry and defense. During the past year, several Honeywell announcements have concentrated on the company's desire to tie those control systems to Honeywell's Information Systems.

The announcement came less than a week after Honeywell restructured its controls business and announced a companywide belt-tightening involving the elimination of 4,000 jobs from the 94,000-employee work force. Honeywell Information Systems employs 22,500 of those workers.

Analyst Michael Geran of E. F. Hutton & Co. said the solicitations of NEC and Bull are Honeywell's attempts to eliminate the cost of developing its own systems. He noted that the computer operation has neutralized some of the profitability of Honeywell's core controls and defense businesses.

Geran said closer ties to NEC and Bull would reduce Honeywell's operating costs while allowing Honeywell customers access to new products and allowing Honeywell itself access to the digital technology it needs for its other business groups. He added that with the existing NEC and Bull agreements, Honeywell's computer manufacturing business is too limited to pay for itself in the international market.

"With a diverse product line, you acquire worldwide economies of scale, and Honeywell doesn't have that product line," Geran said.

Yankee Group analyst Thomas Henkel noted that Honeywell faces heavier competition than ever from IBM, DEC, Sperry and Burroughs. He said the Honeywell-Bull combination "does a decent job" of selling systems in Europe and that NEC's influence "is creeping into Honeywell more and more every day."

Geran predicted Honeywell's computer unit, which accounted for $200 million, or about 30% of the firm's operating profit last year, would earn only $100 million this year. It contributed $2 billion, or about 32%, to Honeywell's $6.62 billion in revenue last year.

IBM redeploys marketing staff

From page 114

ganization, IBM said it hopes to increase by 50% the number of employees working on its 200 largest customers.

The move is also expected to reduce redundancies caused by having three separate marketing support organizations, the spokesman said.

Coupled with IBM's retraining program, the spokesman said the firm expects to increase its marketing organization by approximately 5,000 workers.

"The move will give us approximately 28,000 people in field marketing," he noted.

> ***'It usually happens when times are tough. This is the latest rendition.'***
>
> — Michael Geran
> E. F. Hutton & Co.

The redeployment comes on the heels of IBM's early retirement program that is aimed at reducing costs by reducing its 242,000-member U.S. work force by 4,000 in the next year.

Not a cost-cutting move

Although Big Blue said the redeployment of personnel was not a cost-cutting move, analysts say they believe it will help the firm to reduce expenditures.

"This move, combined with the early retirement plan and efforts to cut travel expenses by $7 million or $8 million, will help IBM reduce it costs levels in the U.S. by an estimated $1 billion by the third-quarter of '87," said Michael Geran of E. F. Hutton & Co. in New York.

Asked how IBM would save money through the marketing shift, Geran said, "Clearly, some people who are being asked to go to the branch level might take advantage of early retirement."

According to Geran, every decade, IBM shifts from a centralized to a decentralized marketing organization, transferring staff back and forth between the branches and headquarters. "It usually happens when times are tough," he said. "This is the latest rendition."

IBM, Geran added, has belatedly realized that it has to be leaner, provide more marketing support and find more clever ways to distribute its products if it is to overcome the prolonged slump in product demand that has caused growth to slow.

"Having more people on the marketing front line will help," he said. "And, by slimming down their headquarters staff, they will speed up decision making."

IBM's objective, according to Geran, is to speed up what IBM Chairman John Akers calls velocity — the process by which IBM designs, manufactures and markets new products. "That is IBM's greatest challenge," Geran concluded.

Microcode ruled copyrightable

From page 114

right. Also at issue within that decision is how hardware restraints may inadvertently create substantially similar microcodes.

"The broadest impact of the ruling is that those who make microprocessors have more protection of their rights than they have had, and that will encourage more licensing agreements and discourage some of the reverse engineering that's been going on," said Howard Bogert, vice-president and director of the semiconductor industry group at Dataquest, Inc., a market research firm in San Jose.

Although both Intel and NEC have claimed victory in the ruling, Bogert said, "It's only the second half of the football game, and the score is still close, although NEC just got a big penalty."

Intel has emerged "the victor in the most significant issue in its copyright infringement case against NEC," said Intel General Counsel P. Thomas Dunlap. "We were convinced all along that microcode is as copyrightable as any other computer program."

But NEC spokeswoman Lourdes Cogswell called the ruling inconsequential and said the greater issue, NEC's supposed infringement on Intel's copyright, has yet to be determined.

NEC was triumphant, she added, because Ingram granted the company's motion to introduce new evidence in the case. That evidence will reportedly show that NEC hired an independent consultant to develop its V-Series of 16-bit microprocessors without access to Intel microcodes.

"The issue to be determined revolves around the 'substantial similarity' between the two codes," Cogswell said. "Because the product we were building had the same substantial restraints that microprocessors have to function within, you have to expect there would be certain similarities. That's not been solved yet by the court, and that's what is behind the infringement issue."

Ingram's ruling, in the meantime, could prove beneficial to Intel in its development of the 32-bit 80386 microprocessor, according to Bogert. "Other suppliers that want to participate in the 386 market will have to work as second sources rather than independent developers on any look-alike products. The owner of the product will have a better chance to get royalties, and as a result, it may preserve the life cycle of their product."

Intel has argued that copyrights are imperative in protecting its investments in research and development. The Santa Clara, Calif.-based company said it has spent over $100 million on development of the 32-bit 386 microprocessor.

Bogert added that the Intel-NEC legal battle was "part of a general trend toward the litigation of intellectual property. In this age of computer design, everything is microcoded and every invention can be reduced to '1' or '0' on magnetic tape."

A ruling on NEC's alleged infringement on Intel's copyrights is not expected for several months.

Deskpro 386 success does not ensure Compaq investment

ACTIVE ISSUES
Kathy Porteus

Although analysts agree that Compaq Computer Corp.'s (CPQ — 154) recently introduced Deskpro 386 computer scores high marks, individuals may not score so well by investing in the company. While quick to praise the Deskpro 386's superior performance, analysts doubt Compaq's new product will change the stock's relatively low valuation.

"Compaq sells at a discount to the market," Harvey Allison, analyst with Wertheim & Co., says, "but the nature of its business and the risk in this business deserves a discount." Allison estimates that Compaq will earn $1.25 to $1.30 per share in fiscal year 1986, ending in December, and $1.35 to $1.40 per share in 1987.

By contrast, Daniel Benton, a securities analyst with Goldman Sachs & Co., estimates Compaq will earn $1.40 per share this year and $1.75 in 1987. Despite his enthusiasm for the company's prospects, Benton says he does not include Compaq on his "buy" list because he questions whether investors are "adequately compensated for bearing the risk in holding Compaq shares."

According to Benton, Compaq's stock is a high-risk situation because the company always trades on external news rather than internal business developments. As an example, Benton cites Compaq's 30% price-per-share decline last June. "No analyst cut his earnings estimates," Benton recalls, "but major retailers Businessland, Inc. and Computerland Corp. announced separately that they would begin selling their own IBM Personal Computer clones."

An analyst considered at least partially responsible for Compaq's June price dip is Wertheim's Allison, who had issued a bearish report on the company and maintains his negative stance today. According to Allison, Compaq is successful because it differentiates its products by adding higher performance features and charging a premium.

"Because lower priced [IBM PC]-compatible products are beginning to offer similar features," Allison says, "it will become increasingly difficult for Compaq to extract that premium from the market."

Charles Wolf, vice-president with First Boston Corp., says he would need to evaluate the distribution of a new competitive product before determining how it would affect Compaq.

"If AT&T, Tandy Corp. or the Businessland/Wyse Technology, Inc. combination rolls out a 386 box, then that would probably raise flags for Compaq," he says. Wolf expects other impressive product introductions based on Intel Corp.'s 80386 microprocessor by Comdex/Fall.

Wolf recently shifted his position from "purchase" to "hold" because his interpretation of various market data indicates that Compaq's "sale momentum has slowed appreciably for its existing computer products."

Furthermore, Wolf says he believes a lack of software exploiting Deskpro 386's microprocessor and a wait-and-see attitude among corporate buyers with one eye on IBM will prevent Compaq's machine from quickly becoming the explosive seller it could be.

Nevertheless, analysts agree that Compaq's debut at preempting IBM makes perfect strategic sense. Analysts say Compaq is better off with its early introduction of Deskpro 386, regardless of whether IBM turns proprietary or continues embracing the open architecture of its existing personal computers.

According to Mike Davis, securities analyst with Schneider, Bernet & Hickman of Dallas, Compaq's impressive margins could even improve when Deskpro 386 reaches volume production. Davis, who has been recommending purchase of Compaq since June 1985, estimates the company will earn $1.30 per share in 1986 and $1.65 per share in 1987.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

DCA completes acquisition

ATLANTA — Digital Communications Associates, Inc. (DCA) last week completed its acquisition of Cohesive Network Corp., a Los Gatos, Calif., developer of T1 products, through the issue of 1.65 million shares of new stock.

The acquisition, approved by DCA shareholders this past July, will be accounted for as a pooling of interests, according to a statement released by the company.

DCA President and Chief Executive Officer Bertil Nordin said the acquisition will enable the firm to broaden its product portfolio from IBM 3270 emulation and networking products to include T1 products.

"Access to Cohesive's T1 technology," Nordin said, "significantly enhances our ability to provide a total network solution to customers."

The market for T1 products, which facilitate the use of high-speed transmission services provided by common carriers, is expected to grow by about 35% annually during the next five years to exceed $700 million, according to San Jose, Calif., market research firm Dataquest, Inc.

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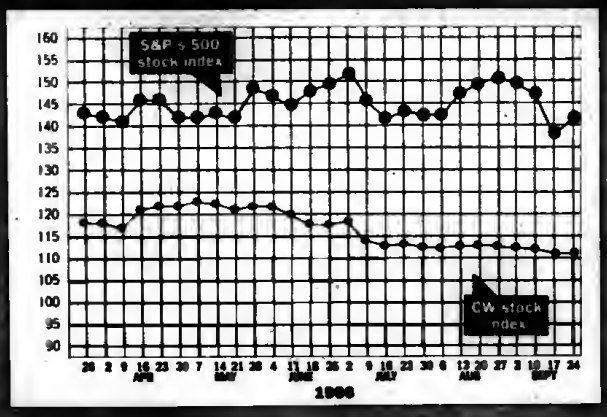
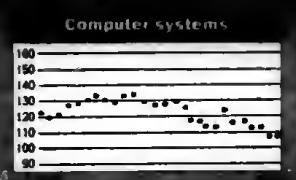
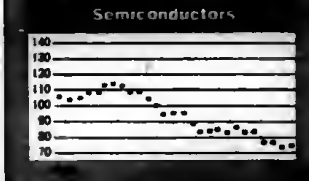
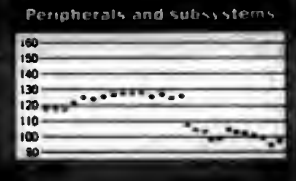
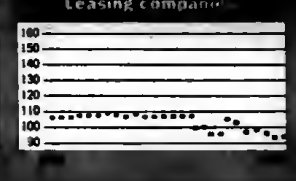
Computerworld stock trading index

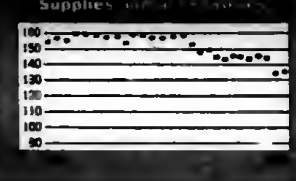












	9/17/86	9/24/86
Computer systems	108.6	108.5
Software and DP services	91.9	94.0
Peripherals and subsystems	94.0	98.5
Supplies and accessories	133.7	134.2
Semiconductors	73.9	74.4
Leasing companies	93.3	93.7
CW stock index	111.3	111.5
Standard and Poor's 500 stock index	138.5	141.3

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 24, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT 24 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	9	4	6.50	-0.1	-1.5
O	ALTOS COMPUTER SYS	19	10	11.13	-0.3	-2.2
A	AMDAHL CORP	23	10	21.13	+2.1	+11.2
O	APOLLO COMPUTER INC	15	5	12.50	+1.1	+9.9
O	APPLE COMPUTER INC	36	19	35.13	+0.6	+2.6
N	AT&T	26	20	23.50	+0.4	+1.8
N	BURROUGHS CORP	75	52	70.13	+0.9	+1.3
O	C P T CORP	7	4	5.88	-0.1	-3.1
N	COMPAQ COMPUTER CORP	18	9	15.75	+1.0	+6.8
A	COMPUTER CONSOLES INC	12	9	7.50	+0.1	+1.7
O	CONCURRENT COMP CORP	28	1	14.00	+0.1	+0.9
N	CONTROL DATA CORP DEL	29	16	26.38	-1.0	-3.7
O	CONVERGENT TECH	14	5	5.88	-0.1	-2.1
N	CRAY RESH INC	100	46	91.75	-1.8	-2.1
O	DAISY SYS CORP	32	9	8.63	-0.3	-2.8
N	DATA GEN CORP	50	30	31.25	-1.3	-3.8
N	DATAPOINT CORP	9	5	7.63	+0.0	+0.0
N	DIGITAL EQUIP CORP	105	61	93.13	-2.0	-2.1
N	ELECTRONIC ASSOC INC	7	4	4.63	+0.5	+15.6
N	FLOATING POINT SYS INC	46	12	13.25	+0.1	+1.0
N	GOULD INC	29	15	18.13	+0.0	+0.0
N	HARRIS CORP DEL	26	22	29.38	+1.1	+4.0
N	HEWLETT PACKARD CO	50	29	43.50	-2.3	-4.9
N	HONEYWELL INC	87	29	70.50	-8.0	-10.2
N	IBM	162	123	127.50	-0.1	-0.1
O	IPL SYS INC	4	1	2.50	+0.0	+0.0
N	ITT CORP	90	32	49.38	+0.4	+0.8
N	M A COM INC	19	13	15.13	+1.8	+11.0
N	MATSUSHITA ELEC INDL LTD	116	46	109.25	+7.3	+7.2
O	MENTOR GRAPHICS CORP	21	11	13.63	-0.3	-2.2
N	MOHAWK DATA SCI CORP	4	1	2.38	-0.1	-5.0
N	MAI INC	18	9	9.25	-0.5	-5.1
N	NCR CORP	57	32	47.88	-2.5	-5.0
N	PRIME COMPUTER INC	28	19	20.75	+0.4	+1.8
N	SPERRY CORP	77	48	75.75	+0.0	+0.0
O	STRATUS COMPUTER	28	15	23.25	+2.3	+10.7
O	SYMBOLICS INC	15	5	4.75	-1.1	-16.1
O	TANDEM COMPUTERS INC	30	13	34.88	+0.4	+1.1
N	TANDY CORP	48	31	31.63	-0.8	-1.6
N	TEXAS INSTRS INC	148	88	113.50	-0.5	-0.7
A	ULTIMATE CORP	25	11	18.88	-0.4	-2.2
A	WANG LABS INC - B	23	12	12.88	-0.6	-4.4
A	WANG LABS INC - C	23	11	13.00	-0.6	-4.3
N	XEROX CORP	72	46	54.63	+1.8	+3.2

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT 24 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	26	26.88	-1.4	-5.0
N	BARRY WRIGHT CORP	25	16	18.75	+0.5	+2.8
A	DUPLEX PRODS INC	23	17	20.50	+0.5	+2.6
N	ENNIS BUSINESS FORMS INC	28	16	23.75	+1.2	+5.7
N	3M CO	118	74	103.38	-0.4	-0.4
N	MOORE LTD	28	16	21.13	-0.3	-4.9
O	STANDARD REGISTER CO	50	32	33.75	-0.5	-1.5
N	WALLACE COMPUTER SVCS	50	33	40.63	+1.3	+3.2

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT 24 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	8.00	+0.3	+5.3
N	ADVANCED SYS INC	20	12	14.00	-0.3	-1.8
N	AGS COMPUTERS INC	25	14	17.50	+0.1	+0.7
O	AMERICAN MGMT SYS INC	20	9	15.00	+0.5	+3.4
O	AMERICAN SOFTWARE INC	16	9	12.50	-0.4	-2.9
N	ANACOMP INC	7	3	3.63	+0.6	+20.8
O	ANALYSTS INTL CORP	10	4	4.00	+0.0	+0.0
O	ASHTON TATE	34	10	29.12	+2.0	+7.4
O	ASK COMPUTER SYS INC	15	7	10.63	+0.0	+0.0
O	ASTRADYNE COMP IND	2	1	2.13	-0.1	-2.9
N	AUTOMATIC DATA PROC	59	24	33.75	+3.3	+10.7
O	COMPUTER ASSOC INTL INC	25	10	22.75	+0.0	+0.0
O	COMPUTER HORIZONS CORP	18	10	10.25	+0.0	+0.0
O	COMPUTER NETWORK TECH	10	2	5.56	+0.1	+2.3
N	COMPUTER SCIENCES CORP	50	23	21.13	-1.0	-3.1
O	COMPUTER TASK GROUP INC	16	11	12.88	+1.4	+12.0
O	COMPUTRONE SYS INC	9	1	0.88	-0.1	-12.5
O	COMSHARE INC	16	9	12.50	+0.5	+7.5
N	CULLINET SOFTWARE INC	20	9	7.25	-0.3	-3.3
O	CYCARE SYS INC	17	10	10.75	+0.0	+0.0
O	DUQUESNE SYS INC	33	11	28.50	+3.3	+12.9
N	GENERAL ELEC CO	63	36	73.50	+1.1	+1.5
N	GENERAL NRTRS CORP	50	33	34.75	+0.1	+0.4
N	GTE CORP	60	38	54.88	+1.9	+3.5
O	HOGAN SYS INC	12	9	10.25	+1.4	+15.5
O	INFORMATION SCIENCES INC	4	1	1.75	+0.5	+16.7
N	INFOTRON SYS CORP	18	9	9.50	+0.0	+0.0
O	KEANE INC	16	9	8.63	-0.4	-5.4
N	LOGICON INC	43	26	26.25	-1.0	-3.7
O	LOTUS DEV CORP	42	15	36.25	+2.0	+5.5
O	MANAGEMENT SCI AMER	18	6	12.25	-0.5	-3.9
O	MCI COMM CORP	13	7	7.75	+0.4	+5.1
O	MICOM SYS INC	23	10	11.00	+0.0	+0.0
O	MICRO PRO INTL CORP	4	2	2.31	+0.2	+8.8
O	MICROSOFT CORP	38	23	29.63	+0.1	+0.4
O	NATIONAL DATA CORP	26	13	20.13	+2.9	+15.8
O	ON LINE SOFTWARE INT	19	8	11.00	+0.8	+7.3
O	ORACLE SYS CORP	29	13	15.75	+0.5	+1.9
N	PANSOPHIC SYS INC	28	18	27.75	-1.3	-4.5
O	PLANNING RSCH CORP	24	14	20.50	-0.3	-1.5
O	POLICY MGMT SYS CORP	24	15	18.00	-0.5	-4.5
O	PROGRAMMING & SYS INC	11	5	6.00	-0.3	-3.5
O	REYNOLDS & REYNOLDS CO	42	18	33.25	+0.0	+0.0
O	SCIENTIFIC COMPUTERS INC	9	4	4.38	+0.0	+0.0
O	SEI CORP	28	15	16.75	+0.8	+1.8
O	SHARED MED SYS CORP	41	29	32.75	+0.3	+0.9
O	SOFTWARE AG SYSTEMS INC	22	13	16.25	-0.8	-5.1
O	SOFTWARE PUBG CORP	10	5	6.13	-0.1	-2.4
A	STERLING SOFTWARE INC	21	7	13.25	+1.3	+8.9
N	UCCEL CORP	24	13	22.00	+1.1	+5.4
N	URS CORP	18	10	15.00	+0.3	+1.7
O	VM SOFTWARE INC	32	17	27.00	-0.3	-0.9

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT 24 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	34	14	17.63	+0.3	+1.4
N	ANALOG DEVICES INC	29	14	18.00	+1.0	+9.9
O	ANALOGIC CORP	19	10	12.00	+0.4	+3.2
N	APPLIED MAGNETICS CORP	32	12	15.50	+0.6	+3.8
O	AVANTEK INC	24	15	16.63	+0.9	+4.7
O	HADCO CORP	7	3	3.63	-0.3	-8.5
O	INTEL CORP	32	16	20.00	-0.5	-2.4
O	MICRO MASK INC	7	2	2.88	+0.0	+0.0
N	MOTOROLA INC	30	20	38.88	-2.6	-6.3
N	NATIONAL SEMICONDUCTOR	19	9	9.13	+0.0	+0.0
N	TERADYNE INC	20	17	18.50	+0.5	+2.8

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT 24 1986	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	3	8.63	+0.5	+9.8
A	ANDERSON JACOBSON INC	3	2	2.75	+0.0	+0.0
O	AST RESH INC	33	11	12.38	+1.5	+13.8
O	AUTOTROL CORP	10	6	8.88	+0.0	+0.0
O	AVANT GRADE COMPUTING	9	3	4.25	+1.3	+41.7
O	BANCTEC INC	13	6	7.50	+0.3	+3.4
N	BOLT BERANEK & NEWMAN	46	29	41.13	+3.9	+10.4
N	CENTRONICS DATA COMP	9	4	7.50	+0.5	+13.2
A	CETEC CORP	9	6	9.88	-0.1	-2.1
A	COGNITRONICS CORP	5	3	3.00	+0.5	+20.0
N	COMPUGRAPHIC CORP	29	16	23.00	+3.8	+15.8
N	COMPUTERVISION CORP	19	9	13.25	+0.1	+1.0
N	COMRAC CORP	19	11	14.75	-0.4	-2.9
A	DATAPRODUCTS CORP	18	11	13.50	+0.0	+0.0
A	DATARAM CORP	18	9	8.13	+0.1	+1.8
O	DATA SWITCH CORP	9	5	5.88	+0.0	+0.0
O	DATUM INC	7	9	4.63	-0.5	-9.8
N	DECISION INDS CORP	19	9	8.13	-0.4	-4.6
O	ENDATA INC	9	3	5.13	+0.9	+14.0
O	EVANS & SUTHERLAND	27	17	21.63	+0.8	+3.8
N	FLOATING POINT SYS INC	46	12	13.25	+0.1	+1.0
O	GANDALF TECHNOLOGIES	9	5	5.38	+0.0	-0.8
N	GENERAL DATACOMM IND	19	9	8.88	+0.0	+0.0
N	HAZELTINE CORP	27	19	19.50	+1.5	+8.3
O	ICOT CORP	12	6	9.13	+0.1	+1.4
O	INFORMATION INTL INC	18	10	14.00	+0.0	+0.0
O	INTECOM INC	7	3	5.31	+0.0	+0.0
O	INTERLEAF INC	19	8	8.00	-0.5	-5.9
O	MEGADATA CORP	9	2	2.25	-0.1	-5.3
A	MSI DATA CORP	14	9	10.25	+0.4	+3.8
N	NASHUA CORP	18	12	21.38	+0.6	+3.2
O	NETWORK SYS CORP	25	10	13.50	+0.0	+0.0
N	NORTH AMERN PHILPS CORP	48	32	36.75	+0.0	+0.0
N	NORTHERN TELECOM LTD	38	25	28.00	-0.3	-0.9
O	NOVELL INC	24	11	21.50	+2.0	+10.3
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	11	5	5.50	+0.5	+10.0
A	PENRIL CORP	9	5	5.00	-0.1	-2.4
N	PLESSEY PLC	28	19	25.50	-1.9	-6.8
O	PRINTRONIX INC	15	11	12.25	-1.0	-7.5
O	QMS INC	15	8	11.88	-0.1	-1.0
O	RAMTEK CORP	7	2	5.50	+0.8	+15.8
N	RECOGNITION EQUIP INC	17	9	13.13	+0.8	+6.1
N	SANDERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	24	12	17.25	+1.0	+6.2
N	SCIENTIFIC ATLANTA INC	18	9	8.88	+0.0	+0.0
O	SEAGATE TECHNOLOGY	19	9	18.88	+1.4	+8.0
N	STORAGE TECHNOLOGY	7	1	2.25	+0.0	+0.0
O	SUN MICROSYSTEM INC	20	11	13.00	-0.8	-5.5
A	T-BAR INC	7	6	6.12	+0.0	+0.0
A	TAB PRODS CO	19	10	13.50	-0.3	-1.8
O	TANDON CORP	9	3	2.63	-0.3	-10.7
A	TEC INC	9	4	4.75	-0.1	-2.6
N	TEKTRONIX INC	65	47	60.38	+0.6	+1.0
O	TELEVIDEO SYS INC	4	2	2.88	+0.0	+0.0
N	TELEX CORP	66	42	60.50	+1.9	+3.2
N	TIMEPLEX INC	24	14	19.13	-0.1	-0.8
N	TITAN CORP	12	6	7.38	-0.6	-8.3
O	VISUAL TECHNOLOGY INC	5	2	3.63	-0.1	-3.3
O	WYSE TECH	19	7	14.25	+0.9	+6.6

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT 24 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	25	13	17.38	-0.3	-1.4
N	CONTINENTAL INFO SYS	12	9	9.13	+0.4	+4.3
O	FINALCO GROUP INC	5	3	3.25	-0.3	-5.9
O	PHOENIX AMERN INC	5	3	3.63	-0.1	-3.3
O	SELECTERM INC	12	5	6.50	+0.4	+6.1
N	U.S. LEASING	46	32	42.13	+1.1	+2.7

COMPUTER INDUSTRY

INSIDE

INSTANT ANALYSIS

"We need the marketing. [Product] development is the easy part. To create and develop marketing takes a long time and costs a lot of money. So, that's what we are buying; we're buying the marketing."

— K. Philip Hwang, Televideo, Inc. president on his firm's acquisition plans, including the pending purchase of Alpha Microsystems, Inc.

Honeywell to restructure

May combine Info Services with NEC, Groupe Bull

By James Connolly

MINNEAPOLIS — Adding its own fuel to a blaze of speculation, Honeywell, Inc. last week announced plans to restructure its computer business, a move that analysts interpreted as a sign that the company may want to sell its Information Systems Group to NEC Corp. and Groupe Bull.

Honeywell issued a terse three-paragraph statement saying that it hopes to strengthen its computer operation. But the announcement left observers wondering whether Honeywell will continue to build its own computers while sharing technology with the other companies or go so far as to abandon the computer business.

The statement said Honeywell is negotiating with NEC and Bull for "the combination of Information Systems" with those companies. It also said the restructuring of the division is intended to "assure its customers of a competitive and compatible product line, greater stability and more services."

However, computer industry analysts interpreted the statement to mean that Honeywell is feeling the pressure of competing with IBM, rapidly growing Digital Equipment Corp. and the combined forces of Burroughs Corp. and Sperry Corp. The pressure, according to several analysts, makes it harder for Honeywell to justify developing its own products rather than reselling computers made by companies like NEC and Bull. Honeywell already has agreements to market NEC mainframes and supercomputers and Bull mid-range systems.

"We hope that by the end of the year we can announce some kind of combination, although I don't know what that combination would look like," Honeywell spokes-

See HONEYWELL page 111

IBM redeploys its marketing divisions in streamline effort

By Alan Alper

ARMONK, N.Y. — In a move aimed at increasing efficiency as well as lackluster revenue, IBM last week said it is forming a new, single national marketing support organization by consolidating staff from two marketing divisions and its Information Systems Group.

Approximately 2,800 employees from the Information Systems Group and IBM's North Central and South West marketing divisions will be shifted to branch sales offices, an IBM spokesman said.

The precise number of employees being redeployed will not be known until after the shift is completed in November, he added.

By forming a single national support or-

See IBM page 112

Microcode ruled copyrightable

By James A. Martin

SAN JOSE, Calif. — The long-standing legal battle over NEC Electronics, Inc.'s alleged copyright infringement on Intel Corp. microprocessors produced a federal court ruling last week that microcode, like software programs, can be considered intellectual property and therefore are protected by copyright laws.

U.S. District Court Judge William Ingram ruled in San Jose that Intel's 8086 and 8088 microprocessor codes are "computer programs within the meaning of the copyright act." The ruling was called a significant victory for microprocessor chip developers, whose microcodes have often been vulnerable to duplication by competitors.

Still to be decided, however, is whether NEC actually infringed on Intel's copy-

See MICROCODE page 112

INDUSTRY INSIGHT
Bob Djurdjevic

Amdahl gets it right with 5890

"Things don't get much better than this," exclaimed an exuberant Dave Anderson, Amdahl Corp.'s vice-president in charge of processor products development, in early August at the company's Sunnyvale, Calif., headquarters. Addressing a group of financial analysts later that month, Anderson repeated the remark in reference to the early field results with Amdahl's 5890 Model 300 mainframes.

Other Amdahl executives were in a similarly upbeat mood, especially after the plug-compatible manufacturer recently announced a 10% increase in the 5890's actual (as opposed to announced) performance. "I still remember what you said to Gene [Amdahl Chairman Eugene White] in 1982 about our corporate image of 'quiet competence,' " remarked a cocky Joe Francesconi, Amdahl's vice-president of worldwide operation. "Well, this time we are not going to keep it quiet."

Far from keeping it quiet, Amdahl has held at least two press and analyst briefings this month in an effort to ensure that everybody, especially its own and IBM's users, heard that this time around, Amdahl's CPU product is off to a good start.

Why such frantic public relations activity? Because Amdahl's launch of its 5860 product in 1982 was anything but competent. The product was late,

See AMDAHL page 96

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

Gould consolidates business as Chairman Ylvisaker resigns

Firm's defense, medical groups on the block

By Alan Alper

ROLLING MEADOWS, Ill. — William T. Ylvisaker, 62, the recently resigned chairman of Gould, Inc., was the guiding force behind the company's dramatic transformation from a stodgy, $100 million maker of batteries in the late 1960s to a $2 billion diversified supplier of computer and electronics products and systems.

His departure after a 19-year stint with the company comes as Gould reverses gears, ending a long-term diversification strategy by streamlining its businesses into three core areas: electronic systems, electronic components and instrument systems. As part of this strategy, Gould put its Defense Systems and Medical Products groups on the block.

Ylvisaker joined Gould in 1967 as president and chief executive officer after spending nine years with General American Transportion, Inc. He was named chairman in 1969.

Earlier this year, the wheels of succession were put in motion as James McDonald, who had been president and chief operating officer since July 1984, replaced Ylvisaker as CEO. The company expects to name a new chairman at its next regularly scheduled board meeting.

Ylvisaker

The following are excerpts from a recent interview with Ylvisaker:

CW: Why are you leaving Gould after all these years?

YLVISAKER: I planned for a long time to leave the company. The timing was based on bringing in the right CEO. We felt we have a good man in McDonald. I will miss Gould but there comes a time in a career that you have to think about doing some different things, and I'm ready for it.

CW: What will you do?

YLVISAKER: I'm interested in developing some private businesses for myself and doing some investment banking. I'm interested in buying some smaller companies and am in the process of working on some business deals. I've set up a company, Corporate Focus, Inc., of Rolling Meadows, to do it and have a small staff already working.

CW: What types of companies are you pursuing?

YLVISAKER: Since I've worked in a variety of businesses, like automotive, electrical, electronic, transportation, services and finance, the companies could come from anywhere. What I'm looking for is opportunity, growth and cash flow.

CW: How will Gould's consolidation affect the firm?

YLVISAKER: I think it's a good thing that will allow the company to focus on its remaining businesses. The company was more diversified in the past than it is today.

In the last four years, essentially, the firm has put more of a focus on

See GOULD page 95

LOOK OUT FOR THE BEST

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